

SR-101L Northwest Area Intersections

Traffic Analysis

**SR-101L, Thunderbird Road to 67th Avenue
Bell Road, 92nd Avenue to 59th Avenue**

Prepared for



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1.0 Introduction

The State Route 101 Loop (SR-101L) Northwest Area Intersections Traffic Analysis (Study) was conducted by the Maricopa Association of Governments (MAG). The purpose was to establish capacity and operational needs based on 2018 existing and 2040 future no-build conditions for Traffic Interchanges (TIs) between Thunderbird Road and 67th Avenue. The study also assessed the potential need for a new TI at Greenway Road and reviewed existing and 2040 future year operations at intersections on Bell Road from 92nd Avenue to 59th Avenue.

1.1 Study Area

SR-101L is a freeway serving nearly 200,000 vehicles per day, connecting the cities of Phoenix, Glendale, Peoria, and others to Interstate 17 (I-17), Interstate 10 (I-10), State Route 51 (SR-51), and State Route 202 Loop (SR-202L). Bell Road is a major arterial serving approximately 40,000 to approximately 60,000 vehicles per day, depending on the location. Land use is predominately commercial along Bell Road within the Study limits. The traffic signals along Bell Road currently operate using an adaptive signal control strategy, Rhythm In|Sync. The adaptive traffic signal system was implemented through a partnership between MAG, Maricopa County Department of Transportation (MCDOT), Arizona Department of Transportation (ADOT), the cities of Glendale and Peoria within the Study limits, and the cities of Phoenix, Scottsdale and Surprise. Each agency maintains control of its own signals.

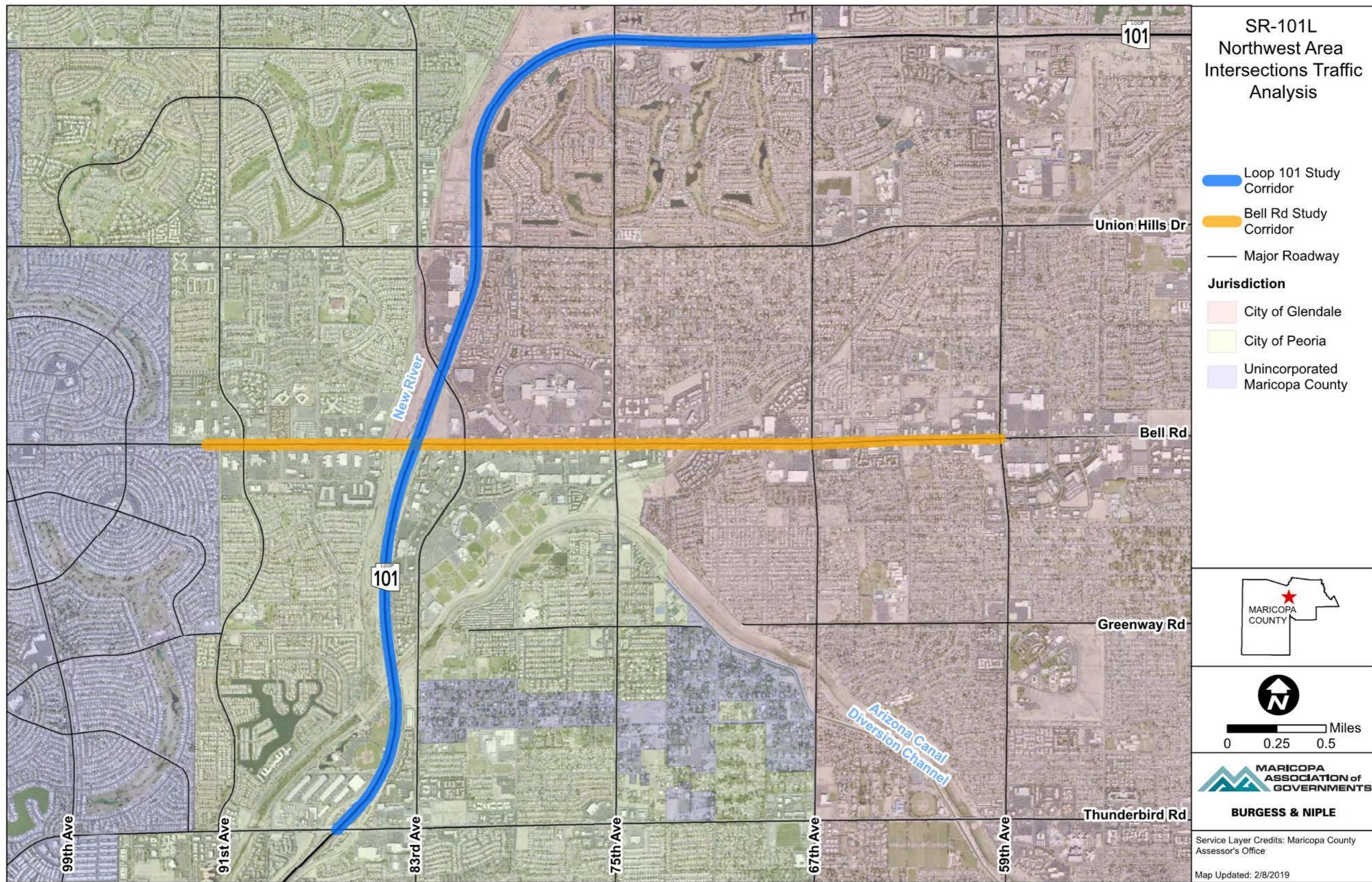
The Study Area, **Figure 1.1**, consists of two distinct corridors: SR-101L between the Thunderbird Road and 67th Avenue TIs (5.5 miles) and Bell Road between the 92nd Avenue and 59th Avenue intersections (4 miles). The Study assessed the following TIs:

- SR-101L and Thunderbird Road;
- SR-101L and Bell Road;
- SR-101L and Union Hills Drive;
- SR-101L and 75th Avenue; and
- SR-101L and 67th Avenue.

The Study assessed the following intersections on Bell Road:

- 92nd Avenue;
- 91st Avenue;
- 87th Avenue;
- 84th Avenue;
- 83rd Avenue;
- 79th Avenue;
- 77th Avenue;
- 75th Avenue;
- 73rd Avenue;
- 69th Avenue;
- 67th Avenue;
- 63rd Avenue; and
- 59th Avenue.

Figure 1.1 – Study Area Map



1.2 Stakeholder Input

During the kick-off meeting, stakeholders expressed interest in specific areas for analysis, including:

- 75th Avenue TI;
- Potential new TI at Greenway Road; and
- Bell Road and 83rd Avenue intersection.

75th Avenue TI

The south-to-eastbound left-turn movement, in particular, does not have the capacity to serve the demand. Existing traffic counts suggest demand for this movement is over 1,000 vehicles in the peak hour, expected to increase in the future.

Potential Greenway Road TI

Interest has been expressed if a new partial TI at Greenway Road would have the potential to alleviate congestion at the SR-101L Bell Road and Thunderbird Road TIs.

Bell Road and 83rd Avenue Intersection

The Bell Road and 83rd Avenue intersection lies between the SR-101L and Bell Road Single Point Unit Interchange (SPUI) and Arrowhead Towne Center shopping center. There is currently high traffic demand on all movements and congestion-related safety concerns. A previous Road Safety Assessment (RSA) recommended an east-to-south right-turn lane, however, this was not previously pursued due to right-of-way needs and additional pedestrian crossing times.

2.0 Previous Studies

This section summarizes known and available plans and studies completed during the past 10 years within the Study Area. Relevant improvements and plan recommendations from the previous studies are included.

2.1 ADOT SR-101L Adaptive Ramp Metering Project, 2019 (in progress)

ADOT, in partnership with Phoenix, Glendale, and Peoria, is advancing an Adaptive Ramp Metering project on SR-101L between I-10 and I-17. The adaptive ramp metering project is part of the Loop 101 Mobility Project. It incorporates components of Integrated Corridor Management to reduce crashes and reduce response time. Each ramp in the corridor, including the five that are part of the Study Area, will be evaluated for improvements to ramp metering.

2.2 City of Peoria Greenway Road and SR-101L Traffic Interchange, 2019 (in progress)

The city of Peoria is evaluating geometric alternatives for a partial TI in the vicinity of Greenway Road at SR-101L. Six preliminary alternatives were developed and evaluated for cost, impacts to surrounding community, impacts to developable city-owned land in the vicinity of the TI, and traffic considerations. The evaluation also factored in recent improvements to the adjacent roadways and long range city planning.

2.3 MCDOT Bell Road Adaptive Signal Control Technology Comprehensive Study, 2019 (in progress)

MCDOT funded a study to evaluate the performance of different Adaptive Signal Control Technologies (ASCT) in four separate project areas along Bell Road. The study will complete a comprehensive review of the newly installed ASCT along Bell Road and will review available data to perform a comprehensive before and after evaluation for each area. The performance of the different ASCT systems will also be evaluated and compared.

2.4 ADOT Five Year Transportation Facilities Construction Program, June 2018

ADOT prepared the 2019-2023 Current Five-Year Transportation Facilities Construction Program to provide a framework for developing projects over the next five-year period. The purpose of the Program is to account for spending of funds on projects ready to advertise within two years of the Program or to establish implementation plans for projects still in preparation. The program identified plans for adaptive ramp metering between I-10 and I-17 on SR-101L, including the Study Area. The program also

identified a plan for the design of an additional general-purpose lane in both directions between the I-10 and US-60 Grand Ave on SR-101L.

2.5 MCDOT Active Transportation Plan, June 2018

MCDOT developed the Active Transportation Plan (ATP) to identify needs and actions to improve the existing active transportation network. The 2018 MCDOT ATP supersedes the MCDOT 1999 Bicycle Transportation System Plan (BTSP). The ATP's purpose is to provide guidance and investments about where, when, why, and how to logically and meaningfully increase active transportation. The study identified Thunderbird Road from 91st Avenue to Del Webb Boulevard as one of five corridors with the highest number of pedestrian and bicycle crashes in Maricopa County. The ATP also identified a need for a sidewalk/path connection on both sides of 99th Avenue from Olive Avenue to Thunderbird Boulevard.

2.6 City of Glendale Capital Improvement Plan, June 2018

The city of Glendale's 2019-2028 Capital Improvement Plan (CIP) is part of its 2018-2019 Annual Budget Book. The CIP is a ten-year roadmap to creating, maintaining, and paying for Glendale's present and future infrastructure needs. The plan identifies improvements to 59th Avenue from Glendale Avenue to SR-101L which include the elimination of lane drops, addition of turn lanes, selected widening, and installation of medians. This project has been deferred.

2.7 City of Glendale 10-Year Transportation Program, June 2018

The city of Glendale maintains a 10-year Transportation Program that identifies the transportation needs of the community, and develops an implementation strategy to address those needs, based on available revenues and community priorities. This program is updated annually. The program identifies limited funds for unspecified improvements to Bell Road between 51st Avenue and SR-101L.

2.8 City of Peoria Capital Improvement Program, June 2018

The city of Peoria developed a 10-year CIP in 2018 to identify infrastructure and facilities in need of design, construction, and maintenance to deliver municipal services to its residents and businesses. The program identified multiple locations within the Study Area for street improvements, along with other maintenance programs necessary to maintain safety and accessibility throughout the city of Peoria. The program identifies a Quality of Life initiative to add and improve bus shelters on 83rd Avenue throughout the city, including the intersection with Bell Road. The program also identifies the construction of a right-turn lane at 83rd Avenue and Bell Road for eastbound to southbound traffic, funded for fiscal year 2020. The Peoria Auto District on Bell Road

from SR-101L to West City Limits is identified as a phased project to enhance the identity and theme of the District and will include improvements to the roadway.

2.9 MCDOT 2019-2023 Transportation Improvement Program, June 2018

The MCDOT annual Transportation Improvement Program (TIP) contains planned roadway system improvements for the County. The TIP allows MCDOT to plan five years of future projects through the development process. The program identifies the continuation of the Bell Road Adaptive Signals project, which overlaps with this project's Study Area. Pavement preservation projects, arterial mill and overlay, and MASH guardrail evaluation are programmed throughout Maricopa County and may include the Study Area as needs arise.

2.10 North Glendale Park-And-Ride Study, May 2018

Valley Metro conducted the North Glendale Park-and-Ride study to assess a new location for a Park-And-Ride in the Northwest Valley. The previous site location for this Park-And-Ride was west of SR-101L and Union Hills Drive. The new Park-And-Ride location will serve the SR-101L corridor; the study recommended it be located on 75th Avenue just north of the SR-101L. The location is planned to open by 2023, contingent upon federal funding. Two other sites—55th Avenue and SR-101L and 67th Avenue and Union Hills Drive—are viable options if the recommended location is not chosen.

2.11 ADOT Loop 101 Mobility Partnership, November 2017

Led by the Federal Highway Administration (FHWA) and ADOT, together with the Loop 101 Mobility Partnership, the Loop 101 Mobility Study addresses the collective goals of reducing congestion, increasing reliability, and improving incident and event management on SR-101L and adjacent arterials. The project encompasses the entirety of the 61-mile SR-101L corridor, including the Study Area. Proposed improvement technologies include: a Decision Support System (DSS) to help recommend the best set of Integrated Corridor Management (ICM) responses; Adaptive Signal Control Technology (ASCT) for key arterial corridors; Connected Vehicle (CV) applications for transit and incident response vehicles; adaptive ramp metering technology; and an Integrated Traveler Mobility application to provide citizens real-time traffic updates and to provide assistance to visually and/or hearing-impaired users at pedestrian crossings.

2.12 MCDOT Bell Road Adaptive Signals, June 2017

The Bell Road Adaptive Signals project was conducted by MCDOT in partnership with the cities of Surprise, Peoria, Glendale, Phoenix and Scottsdale. The purpose of this project was to install real-time ASCT systems along Bell Road, near and at the four freeway interchanges (SR-303L, SR-101L, I-17 and SR-51). The automated system enables traffic controllers to respond to traffic demand fluctuations in real-time,

dynamically updating signal control parameters like cycle length and split times to improve travel times and reduce stops for vehicles traveling the corridor.

2.13 MCDOT Transportation System Plan 2035, March 2017

MCDOT developed the 2035 Transportation System Plan (TSP) to plan for long-term transportation needs on Maricopa County's transportation network. The plan incorporated three horizon years: 2020, 2025, and 2035. The Design section of the TSP identifies corridors near the Study Area that are projected to exceed an acceptable Level of Service (LOS) by each of the horizon years. Bell Road from 111th Avenue to Del Webb Boulevard and 103rd Avenue from US-60/Grand Avenue to Thunderbird Road are both corridors expected to exceed the acceptable LOS by 2020.

2.14 City of Glendale Transportation Plan, June 2009

The city of Glendale developed a General Transportation Plan in 2009 to understand current conditions and define future transportation improvements. The plan has identified several locations in the Study Area for street improvements. The plan recommends adding one through lane on Thunderbird Road from 67th Avenue to 51st Avenue. The plan also recommends increasing the number of lanes from four to six lanes on 67th Avenue from SR-101L to Deer Valley Road.

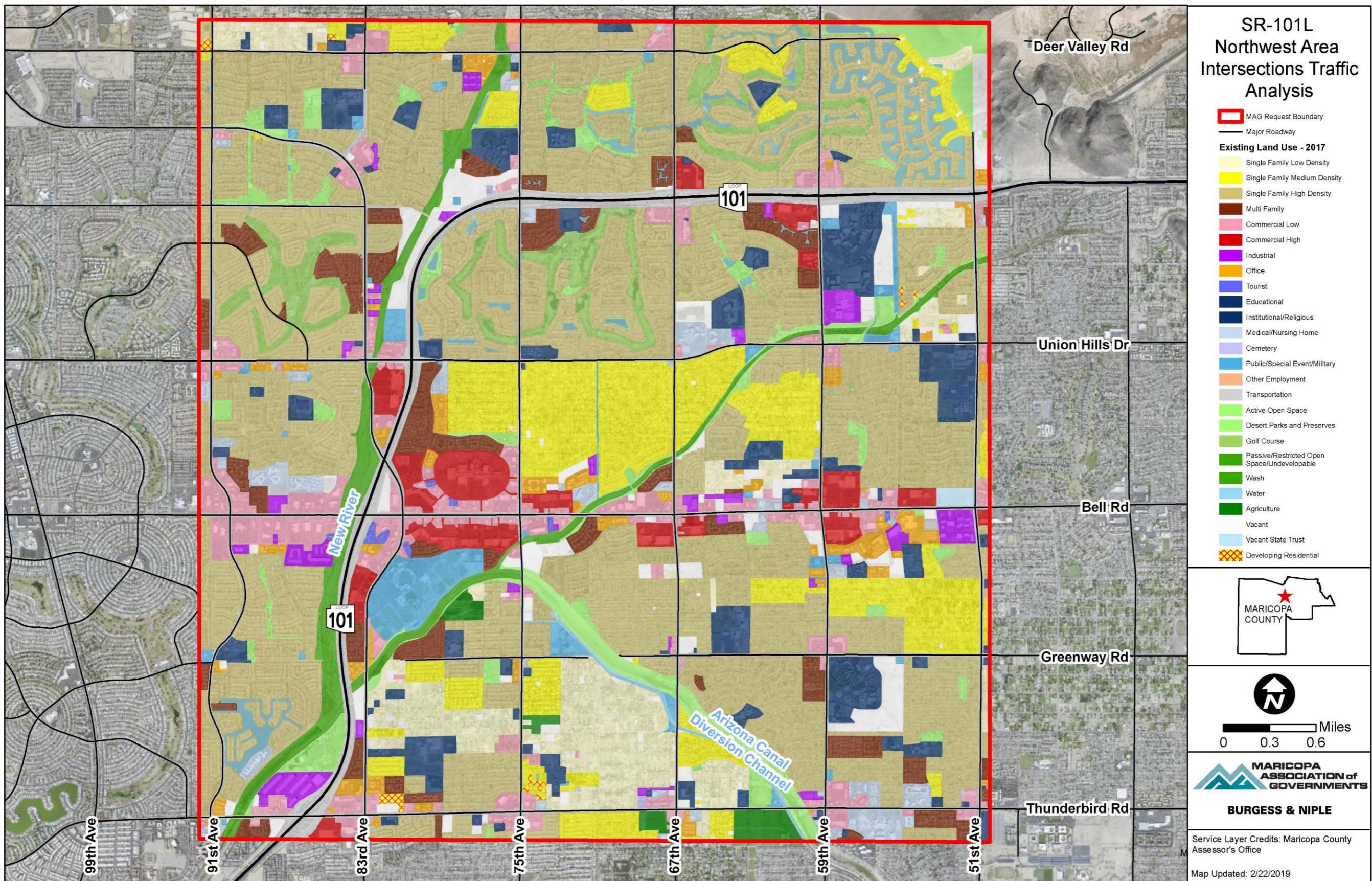
3.0 Land Use

Existing (2018) and future (2040) land use in the Study Area was obtained from MAG to inform trip patterns and mode choice (transit, bicycle, pedestrian, and personal vehicle) decisions. These factors directly influence the operational performance of the Study Area roadway network. Existing Study Area land use, total acreage, and percentage is listed in **Table 1** and illustrated in **Figure 3.1**.

Table 1 – Existing Land Use

| Land Use | Total Acres | Percentage |
|-------------------------------|---------------|-------------|
| Single Family High Density | 6,641 | 38.22% |
| Single Family Medium Density | 1,679 | 9.66% |
| Transportation | 1,235 | 7.11% |
| Commercial Low | 896 | 5.16% |
| Single Family Low Density | 829 | 4.77% |
| Educational | 724 | 4.17% |
| Multi Family | 703 | 4.04% |
| Active Open Space | 674 | 3.88% |
| Vacant | 586 | 3.37% |
| Commercial High | 493 | 2.84% |
| Golf Course | 485 | 2.79% |
| Wash | 405 | 2.33% |
| Water | 315 | 1.82% |
| Public/Special Event/Military | 312 | 1.80% |
| Medical/Nursing Home | 296 | 1.70% |
| Office | 294 | 1.69% |
| Industrial | 244 | 1.40% |
| Religious/Institutional | 234 | 1.35% |
| Desert Parks and Preserves | 113 | 0.65% |
| Agriculture | 104 | 0.60% |
| Passive/Restricted Open Space | 37 | 0.21% |
| Developing Residential | 23 | 0.13% |
| Tourist Accommodations | 21 | 0.12% |
| Vacant State Trust | 18 | 0.10% |
| Other Employment | 8 | 0.05% |
| Cemetery | 6 | 0.03% |
| Total | 17,374 | 100% |

Figure 3.1 – Existing Land Use



Single-family residential land use accounts for approximately 53 percent of the Study Area and includes high density (more than four dwelling unit/acre), medium density (one to four du/ac), and low density (less than one du/ac). An additional four percent is multi-family residential, scattered throughout the Study Area.

Commercial land use accounts for approximately eight percent of the Study Area and includes neighborhood and community retail, movie theatres, specialty retail, and regional retail centers. Both low- and high-density commercial land use are focused on Bell Road and near SR-101L. Arrowhead Towne Center is located on Bell Road between 83rd Avenue and 75th Avenue, just east of SR-101L.

Public/Special Event/Open Space use accounts for nine percent of the Study Area and includes the Peoria Sports Complex, located on 83rd Avenue south of Bell Road and east of SR-101L.

There are 22 public schools located within and adjacent to the Study Area: Coyote Hills Elementary School; Sunrise Mountain High School; Frontier Elementary School; Apache Elementary School; Desert Harbor Elementary School; Paseo Verde Elementary School; Centennial High School; Legacy Traditional School; Pioneer Elementary School; Cactus High School; Foothills Elementary School; Greenbriar Elementary School; Arrowhead Elementary School; Highland Lakes School; Sierra Verde Elementary School; Legend Springs Elementary School; Deer Valley High School; Desert Sky Middle School; Challenge Charter School; Desert Heights Charter School; Canyon Elementary School; and Kachina Elementary School.

Three universities are located just outside of the Study Area that have the potential to impact traffic patterns. Midwestern University's Glendale campus is located on the southeast corner of 59th Avenue and SR-101L. The Arizona Christian University is located on the southeast corner of 59th Avenue and Greenway Road. Arizona State University's West Campus is located on the southeast corner of 51st Avenue and Thunderbird Road.

Abrazo Arrowhead Hospital is located just outside of the Study Area, on the northeast corner of Union Hills Drive and 67th Avenue. Similarly, Banner Thunderbird Medical Center is located on the south side of Thunderbird Road between 59th Avenue and 55th Avenue. Both hospitals have the potential to impact traffic patterns and flow within the Study Area.

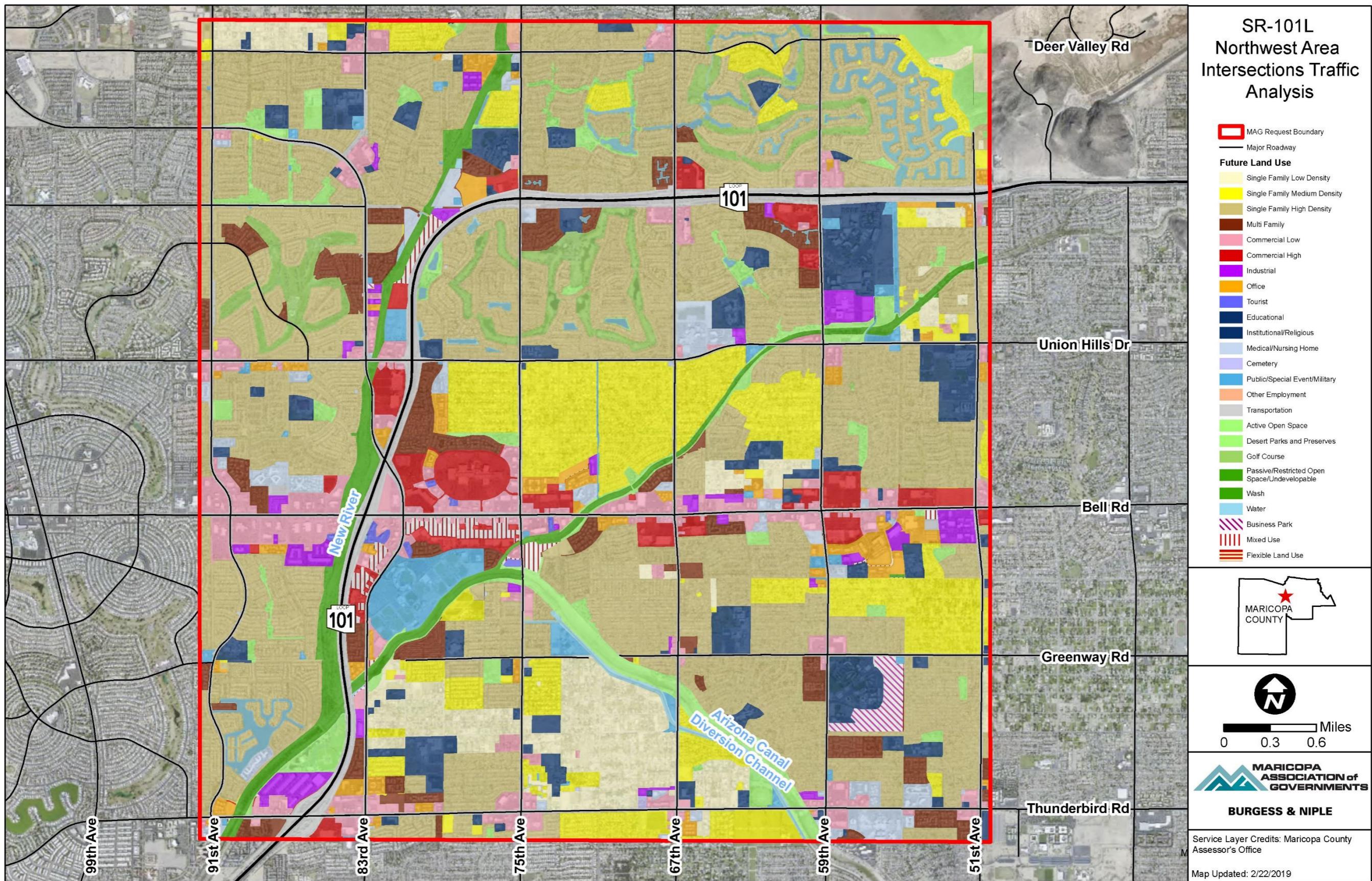
Future land use in the Study Area was obtained from MAG and is not expected to change significantly. **Table 2** summarizes the anticipated changes to acreage and

percent of the whole. Vacant and agricultural space is expected to be developed into further residential, commercial, and office spaces. Single family medium density land use is expected to grow from ten percent to eleven percent. Mixed use land space will be introduced and will account for one percent of the total area. **Figure 3.2** illustrates the anticipated land uses in 2040.

Table 2 – Future Land Use

| Land Use | Total Acres | Percentage | Change in Acreage from Existing (acres) |
|-------------------------------|---------------|-------------|---|
| Single Family High Density | 6,675 | 38.42% | +34 |
| Single Family Medium Density | 1,854 | 10.67% | +175 |
| Transportation | 1,238 | 7.12% | +3 |
| Commercial Low | 920 | 5.29% | +24 |
| Single Family Low Density | 884 | 5.09% | +55 |
| Educational | 778 | 4.48% | +54 |
| Multi Family | 750 | 4.32% | +47 |
| Active Open Space | 691 | 3.97% | +17 |
| Commercial High | 505 | 2.91% | +12 |
| Golf Course | 485 | 2.79% | +0 |
| Wash | 400 | 2.30% | -5 |
| Medical/Nursing Home | 351 | 2.02% | +55 |
| Office | 347 | 1.99% | +53 |
| Water | 320 | 1.84% | +5 |
| Public/Special Event/Military | 312 | 1.80% | +0 |
| Industrial | 262 | 1.51% | +18 |
| Religious/Institutional | 235 | 1.35% | +1 |
| Desert Parks and Preserves | 113 | 0.65% | +0 |
| Mixed Land Use | 110 | 0.63% | +110 |
| Business Park | 68 | 0.39% | +68 |
| Passive/Restricted Open Space | 39 | 0.22% | +2 |
| Tourist Accommodations | 25 | 0.14% | +4 |
| Other Employment | 8 | 0.05% | +0 |
| Cemetery | 4 | 0.02% | -2 |
| Total | 17,372 | 100% | |

Figure 3.2 – Future Land Use



4.0 Existing and Future Transportation Network

4.1 Existing Network

The existing (2018) transportation network for the Study Area is shown in **Figure 4.1**. This is the network upon which all existing conditions models developed for this Study are based. The network is color-coded by the number of through lanes. Signalized intersections along Bell Road that were assessed as part of this Study are indicated on the figure.

4.2 Future Network

There are two main modifications to the existing transportation network within the Study Area expected by 2040 which significantly impact the traffic analysis conducted for this Study. They are:

- An additional general-purpose (GP) lane on SR-101L; and
- Additional ramp metering on SR-101L entrance ramps.

These modifications were included in the future year micro- and macrosimulation models, discussed in **Sections 6.1.5** and **6.1.6**, respectively.

4.3 Access

Future Study Area actions may consider access management policies and access revisions near SR-101L TIs and Bell Road.

Access points were documented within 1,500 feet of the ramp terminals for SR-101L TIs within the Study Area. The points are shown in **Figure 4.2**. Both driveways and intersecting minor roads are included. For access control near interchanges, ADOT provides the following guidance in its Roadway Design Guidelines:

"Full access control shall extend along the crossroad a minimum of 660 ft beyond the end of exit ramp radius returns. From entrance ramps, full access control shall extend along the crossroad a minimum of 330 ft beyond the radius return. Between 330 ft and 660 ft from the entrance ramp returns, access along the crossroad shall be limited to right-in / right-out only."

All Study Area TIs do not conform with the ADOT Roadway Design Guidelines for access control guidance.

There are numerous access points on Bell Road within the Study Area extents. The access points include commercial-access driveways and unsignalized three- and four-way intersections. There are no driveway access points that lead directly to a residence along Bell Road. **Figure 4.3** shows the access points on Bell Road from 92nd Avenue to 59th Avenue.

In total, there are 98 access points within the approximately four-mile stretch and nearly 24 access points per mile. The number of access points per mile is one of many factors which may be considered for access management along a corridor, including access type, spacing, and proximity to other elements of the roadway network. It is up to the local jurisdiction to decide the access management policies that best suit its needs and what an acceptable access point density is for a facility. In general, numerous access points along a corridor can diminish a corridor's overall operations and, according to the TRB Access Management Manual (2014), crash frequency increases as access point density increases. For urban and suburban areas, the TRB Access Management Manual provides research indicating the crash rate for corridors with over 20 access points per mile is almost double the crash rate for corridors with less than 20 access points per mile. As noted above, the Bell Road study corridor has approximately 24 access points per mile.

Figure 4.1 – Existing Transportation Network

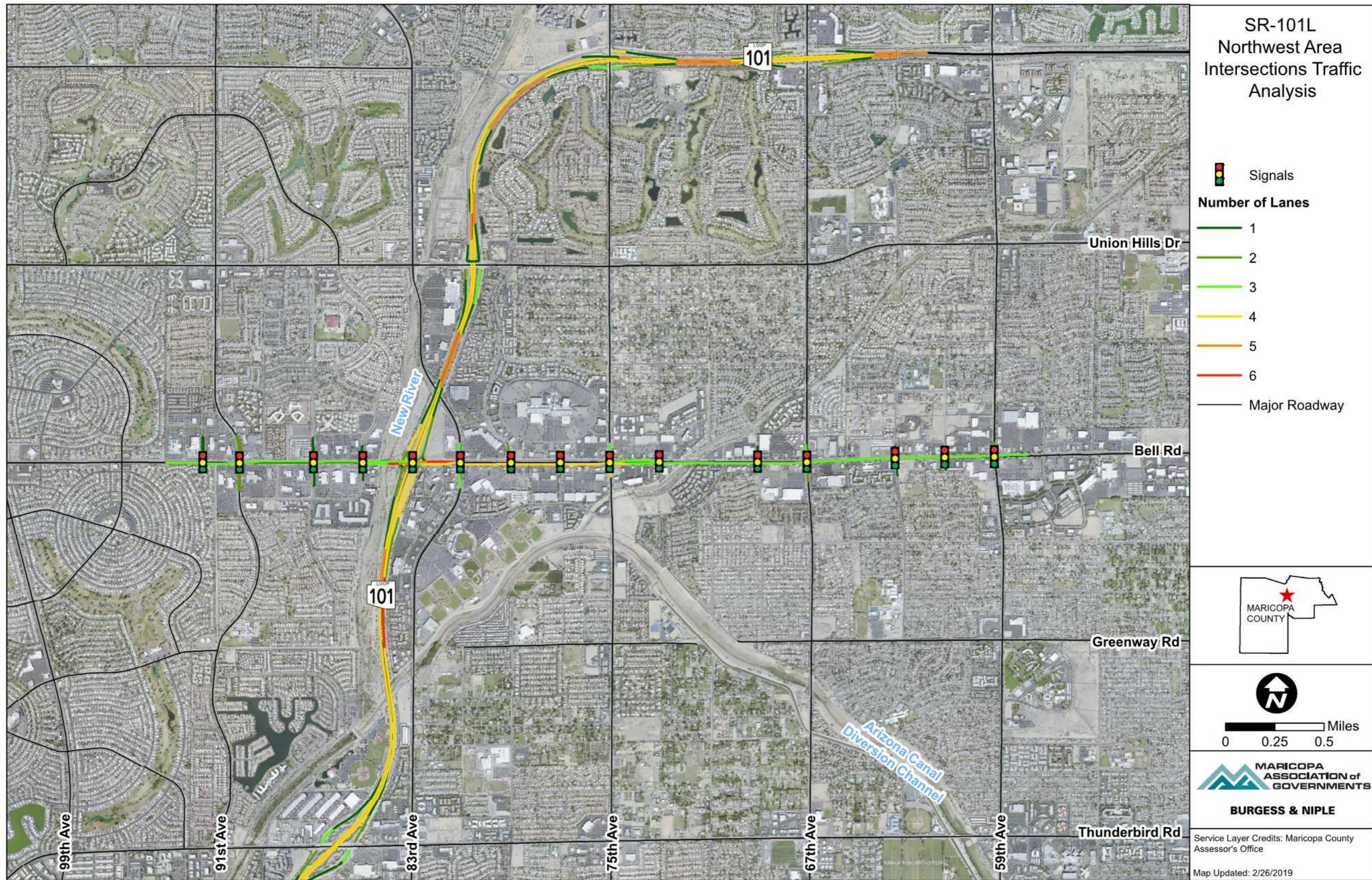


Figure 4.2—SR-101L TIs: Access Points

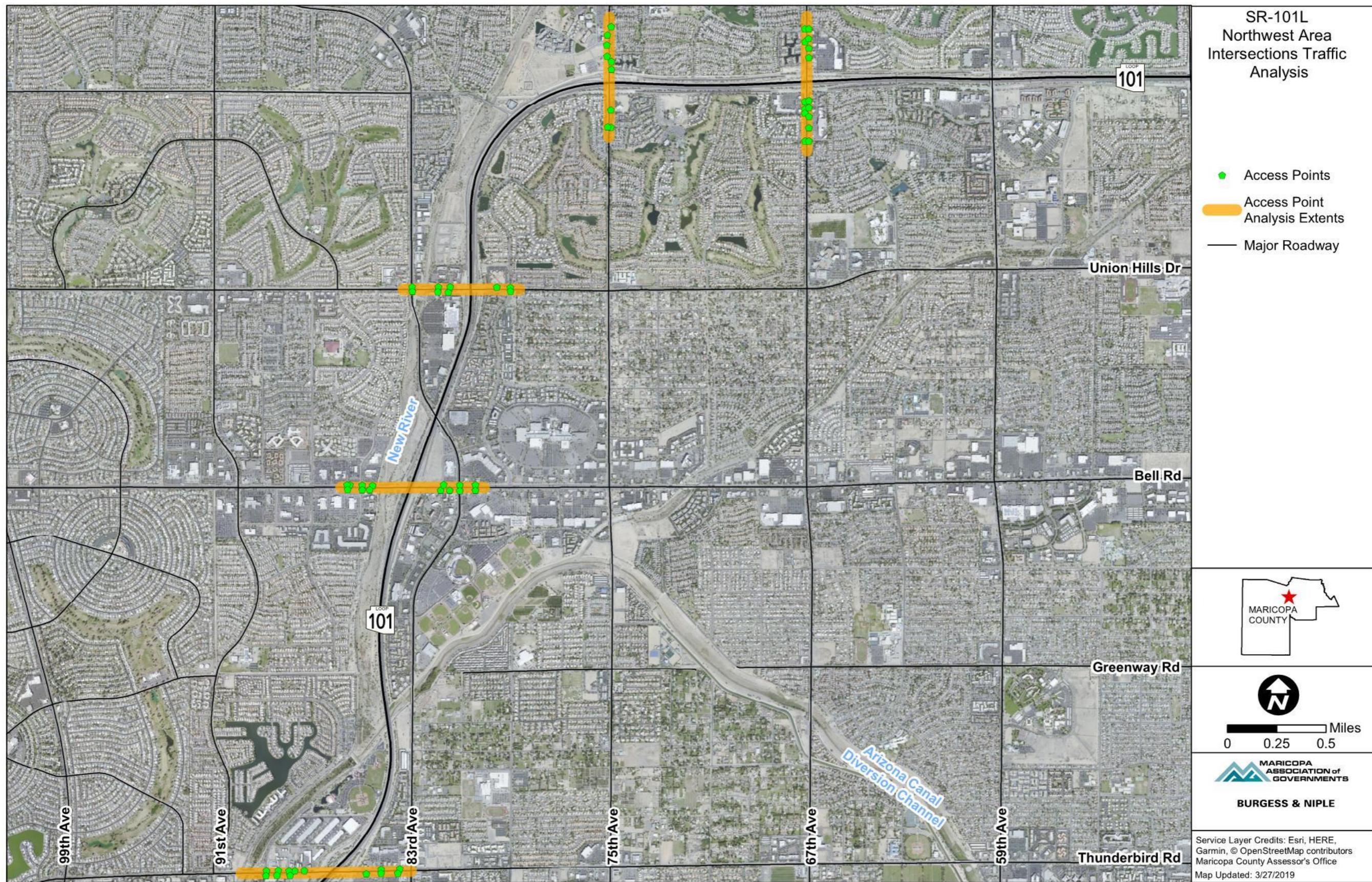
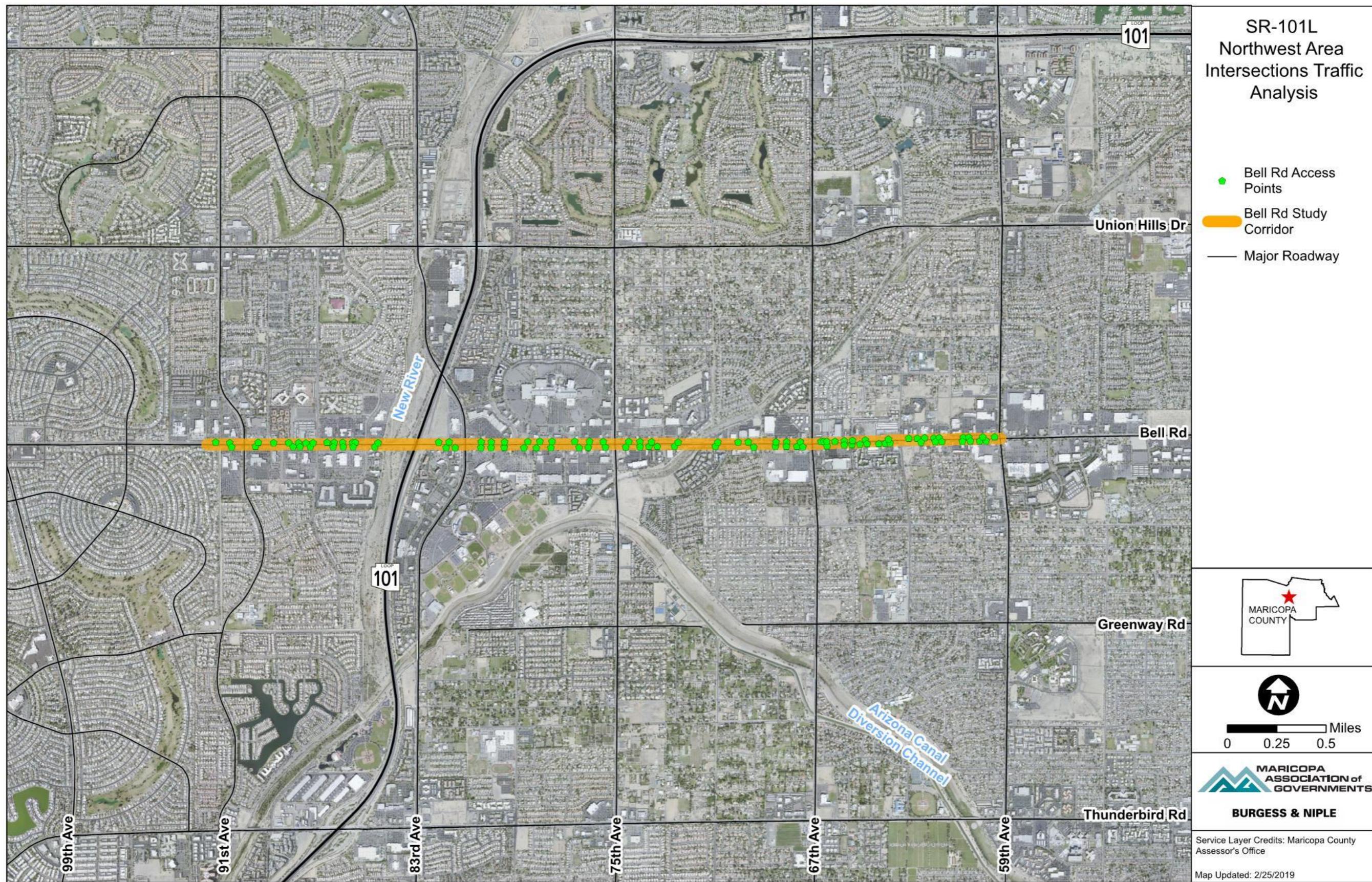


Figure 4.3 – Bell Road: Study Area Access Points



4.4 Traffic Volume

4.4.1 Existing Turning Movement Counts

Turning movement counts were collected in the Study Area for the five TIs along SR-101L and eight signalized intersections on Bell Road. Some counts were collected specifically for this study; additional counts (2015 or more recent) were provided by the city of Glendale as available. Counts collected specifically for this study were collected on November 13, 2018, during the a.m. and p.m. peak hours, a date expected to exhibit "typical" travel patterns for the Study Area. Area schools and universities were in session on this day. Counts were provided by the city of Glendale at the following locations:

- SR-101L and 75th Avenue (2016);
- SR-101L and 67th Avenue (2016);
- Bell Road and 75th Avenue (2016);
- Bell Road and 67th Avenue (2015); and
- Bell Road and 59th Avenue (2016).

For counts taken between 2015 and 2018, the count was grown by two percent per year to produce 2018 volumes. At location where counts were unavailable, turning movement volumes were estimated using modeling techniques discussed in **Section 6.1.6**. Existing turning movement volumes were estimated for the following intersections:

- Bell Road and 91st Avenue;
- Bell Road and 84th Avenue;
- Bell Road and 73rd Avenue;
- Bell Road and 69th Avenue; and
- Bell Road and 63rd Avenue.

Traffic count data collected in conjunction with this Study is included in **Appendix A**.

Figure 4.4 shows numbered intersections for SR-101L and Bell Road within the extents of the Study Area. **Figure 4.5** and **Figure 4.6** show the existing turning movement counts for SR-101L and Bell Road at the numbered intersections, respectively. Locations at which counts were estimated are not shown.

4.4.2 Future Turning Movement Counts

Future (2040) turning movement counts were developed using forecasting methodology presented in the National Cooperative Highway Research Project's (NCHRP) 765 Report: Analytical Travel Forecasting Approaches for Project-Level Planning and Design, discussed in **Section 6.1.2**. **Figure 4.7** and **Figure 4.8** present future 2040 turning movement counts for the same locations shown in **Figure 4.5** and **Figure 4.6**.

Figure 4.4 – Turning Movement Count Map

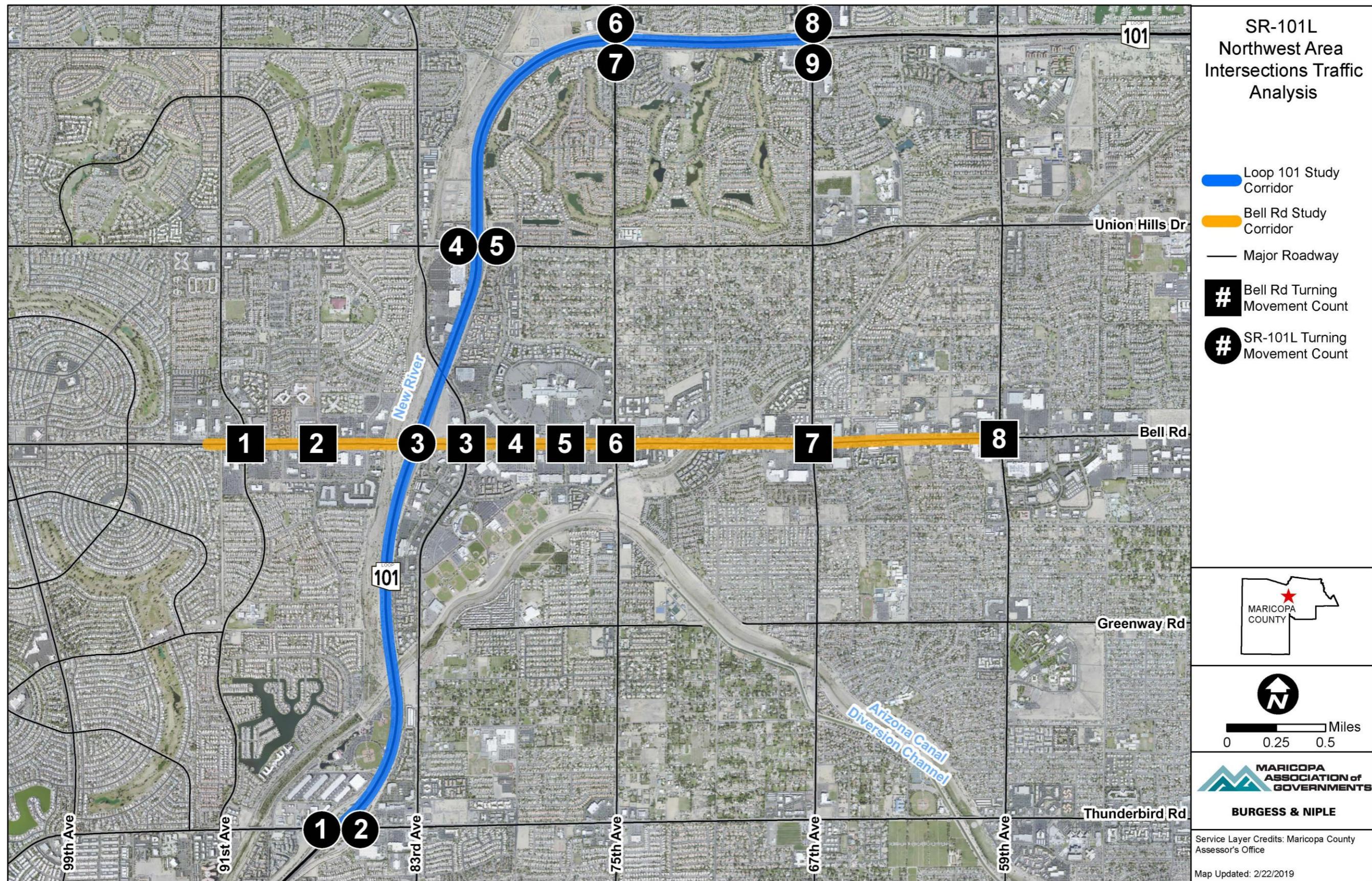


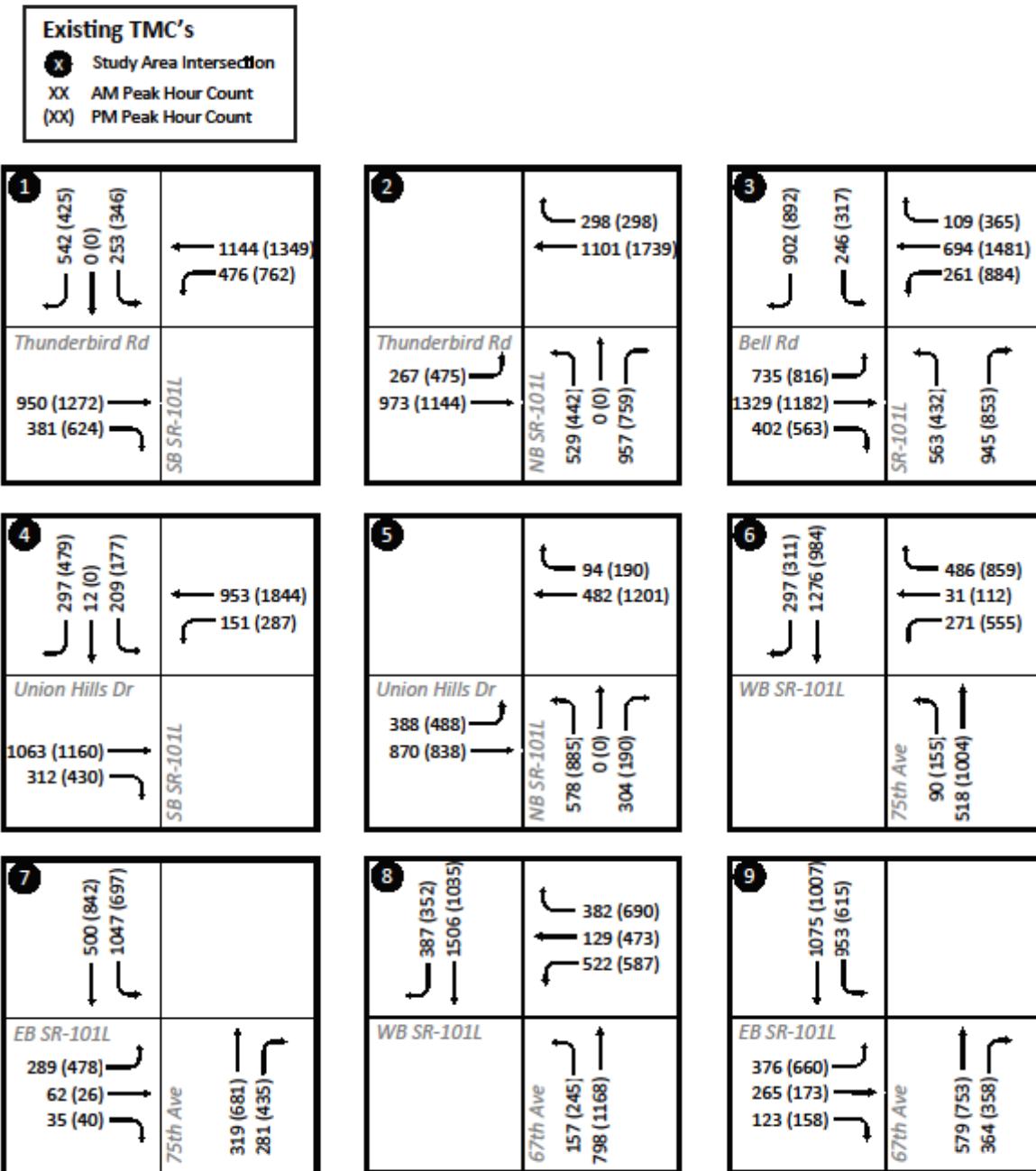
Figure 4.5 – SR-101L Existing Turning Movement Counts


Figure 4.6 – Bell Road Existing Turning Movement Counts

Existing TMC's

- X** Study Area Intersection
- XX** AM Peak Hour Count
- (XX)** PM Peak Hour Count

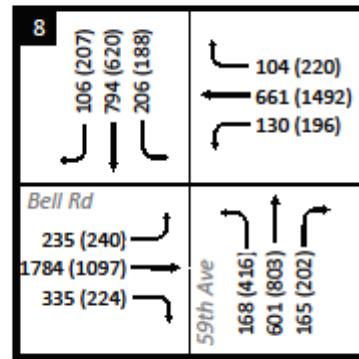
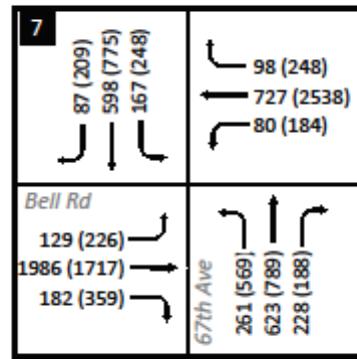
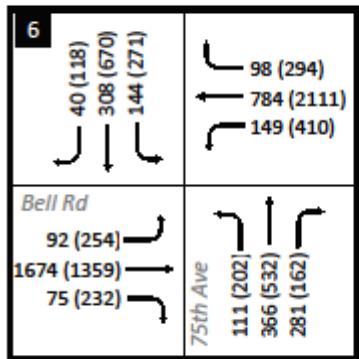
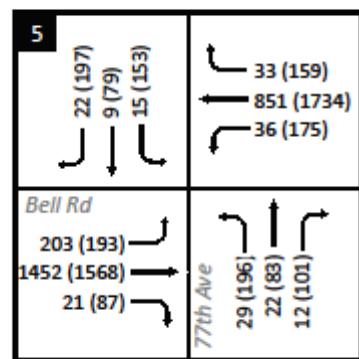
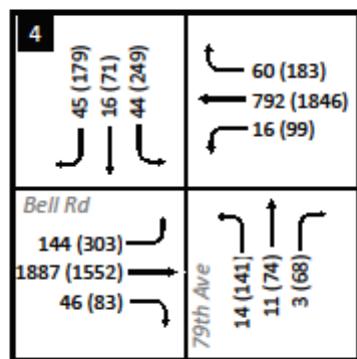
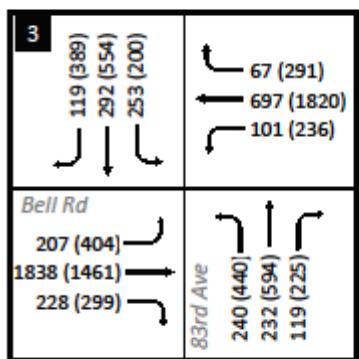
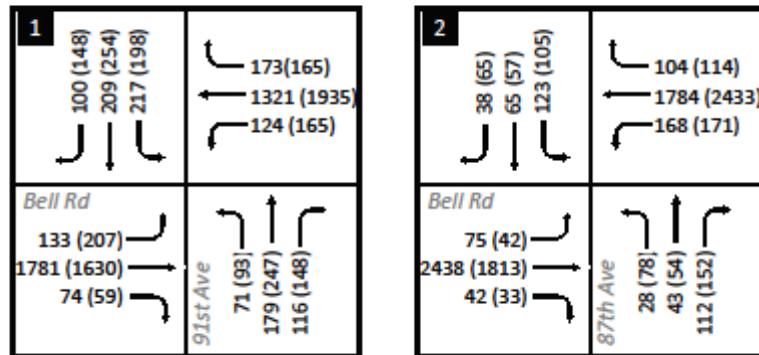


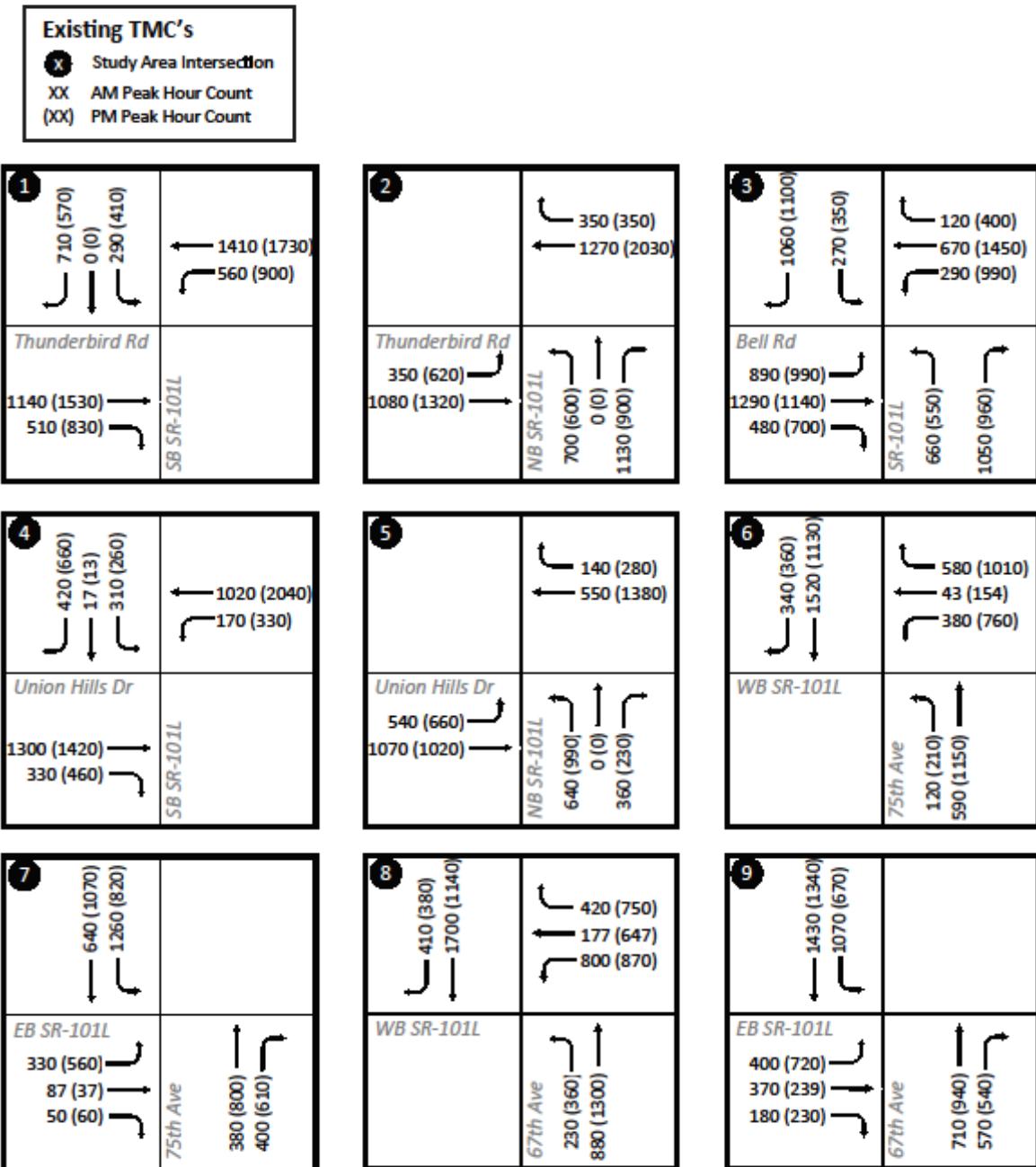
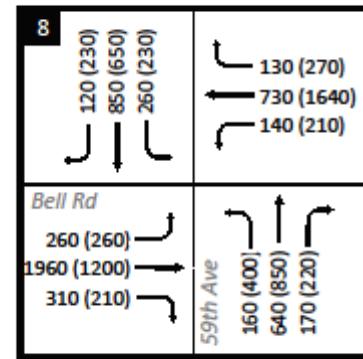
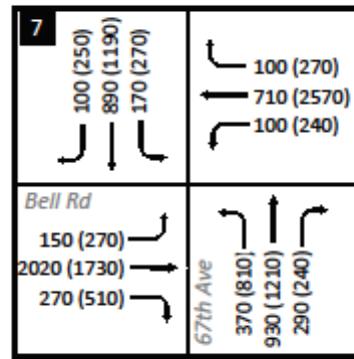
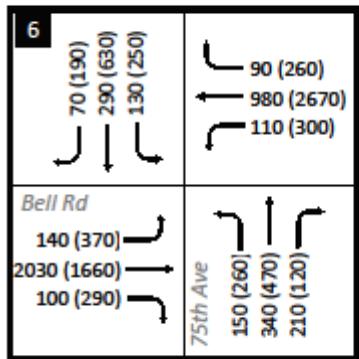
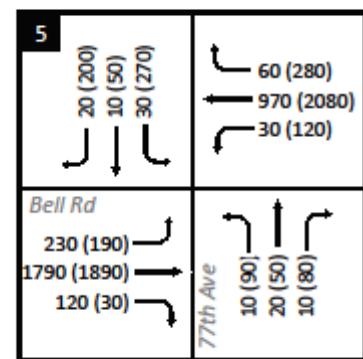
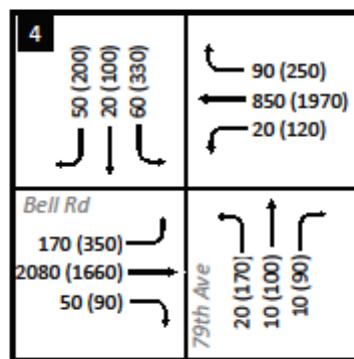
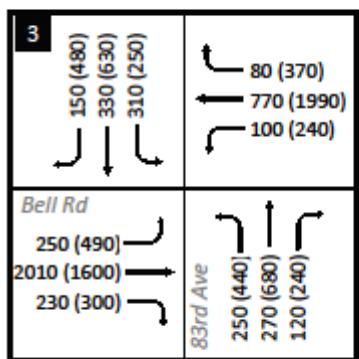
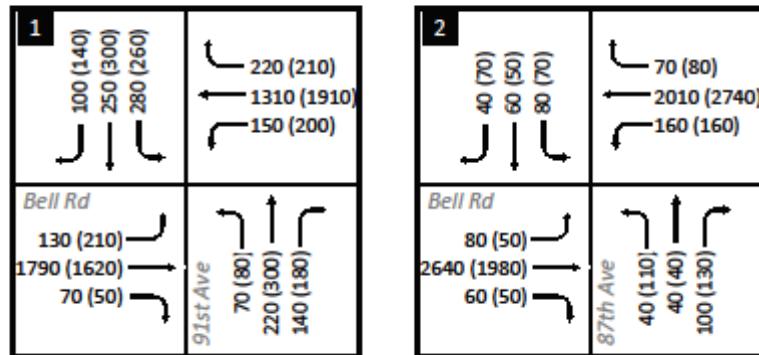
Figure 4.7 – SR-101L Future Turning Movement Counts


Figure 4.8 – Bell Road Future Turning Movement Counts

Future TMC's

- X** Study Area Intersection
- XX** AM Peak Hour Count
- (XX)** PM Peak Hour Count



4.4.3 Existing and Future ADT

The most recent available Average Daily Traffic (ADT) for arterials in the Study Area were collected from exhibits on the City of Glendale and City of Peoria websites. These exhibits are provided in **Appendix B**. The counts provided on these exhibits were collected between 2015 and 2017. Depending on the associated date, counts were grown by two percent per year to estimate a 2018 count. ADT was collected for SR-101L and SR-101L ramps using ADOT's online Traffic Data Management System (TDMS) web mapping application. Mainline ADTs were calculated from 24-hour ramp volume counts and the 24-hour mainline count from Tuesday, November 14, 2017, at a continuous count station (Station ID: 101216) between the Thunderbird Road and Bell Road TIs. Future ADT was developed using NCHRP 765 traffic forecasting methodology described in **Section 6.1.2**. **Figure 4.9** shows existing and future ADT along Bell Road and the SR-101L mainline throughout the Study Area. Existing volumes are represented in black and future volumes in red.

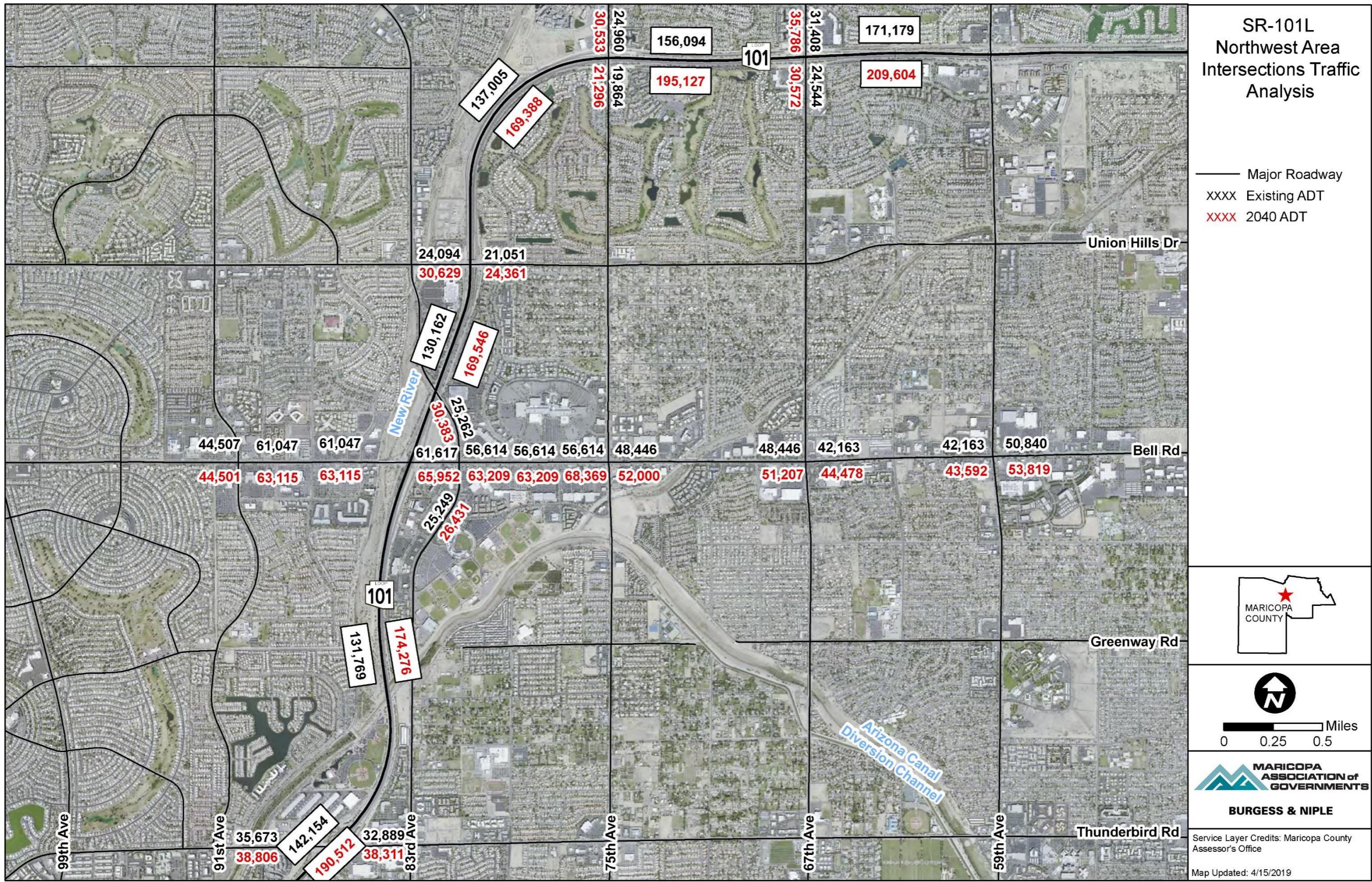
Traffic volumes along Bell Road are the highest nearest the SR-101L and Bell Road TI (between 60- and 70,000 vehicles per day). East and west of the Bell Road TI, ADT along Bell Road is between 40- and 50,000 vehicles per day. Between 2018 and 2040, the most growth along Bell Road is expected in the vicinity of the Arrowhead Town Center (12 percent). Expected growth is approximately six percent east of Arrowhead Town Center and less west of the Bell Road/SR-101L TI.

Traffic volumes along the mainline SR-101L are highest east of the 67th Avenue/SR-101L TI (approx. 162,000 veh/day) and south of the Thunderbird Road TI (approx. 142,000 veh/day). Between 2018 and 2040, traffic demand on SR-101L within the Study Area is expected to grow between 22 and 34 percent. The most growth is expected nearest the Thunderbird Road TI (34 percent), while the least growth is expected east of the 67th Avenue TI (22 percent).

4.5 Traffic Signal Timing Plans

Traffic signal timing plans and phasing diagrams were provided for all Study Area TIs by ADOT and are available upon request. Existing timing plans were used to model existing conditions for the TIs. Signal timing was optimized for intersections along Bell Road to model the operations of Bell Road's adaptive signal control system, Rhythm In|Sync. This analysis is discussed in more detail in **Section 6.1.3**.

Figure 4.9 – Existing and Future AD



5.0 Safety

Crash data for the five-year period from January 1, 2013, through December 31, 2017, was provided by MAG and the city of Glendale from the MAG Regional Transportation Safety Information Management System (RTSIMS) database to assess safety in the Study Area. Safety was assessed for SR-101L TIs, for SR-101L mainline segments, and for intersections along Bell Road in **Sections 5.1, 5.2 and 5.3**, respectively. **Figure 5.1** shows a crash heat map for SR-101L and the number of crashes by intersection for Bell Road.

Unless otherwise noted, MAG provided crash data is presented in the following tables. Alternate crash data provided by the city of Glendale is available in **Appendix D**. Of the provided crash data, the highlighted records are pertinent to this Study.

5.1 SR-101L TI Safety Analysis

Crashes were analyzed for each SR-101L TI within the Study Area. **Table 3** summarizes crashes at each TI by Injury Severity and **Table 4** summarizes crashes at each TI by collision manner. Crash data for the TIs was provided by MAG following MAG's standard export procedures for the specified five-year time period. Crash data for the 75th Avenue and 67th Avenue TIs was also provided by the city of Glendale to verify crash information. Following review and coordination between both agencies, the datasets provided by the city of Glendale were utilized in the analysis. They are marked accordingly in **Table 3** and **Table 4**.

Table 3 – SR-101L TIs: Injury Severity by TI

| SR-101L TI | Fatal | Incapacitating | Non-incapacitating Injury | Possible Injury | No Injury | Total |
|--------------------------|-------|----------------|---------------------------|-----------------|-----------|-------|
| Thunderbird Road | 0 | 4 | 5 | 12 | 54 | 75 |
| Bell Road | 0 | 5 | 7 | 16 | 96 | 124 |
| Union Hills Drive | 0 | 0 | 7 | 12 | 63 | 82 |
| 75th Avenue ¹ | 0 | 3 | 3 | 13 | 73 | 92 |
| 67th Avenue ¹ | 0 | 1 | 9 | 26 | 121 | 157 |

¹Crash data provided by City of Glendale

The 67th Avenue TI had the most crashes of all TIs in the Study Area, followed by the Bell Road TI. There were no fatal crashes at any of the intersections during the five-year period; however, all but the Union Hills Drive TI had at least one incapacitating crash.

Table 4 summarizes the crashes at each TI by collision manner. For all TIs in the Study Area, rear end was the dominant collision manner. The 67th Avenue TI had the most angle, left-turn, rear end, and same-direction sideswipe crashes of all TIs. The Bell Road TI had the most rear end and single vehicle crashes.

Figure 5.1 – Crash Map

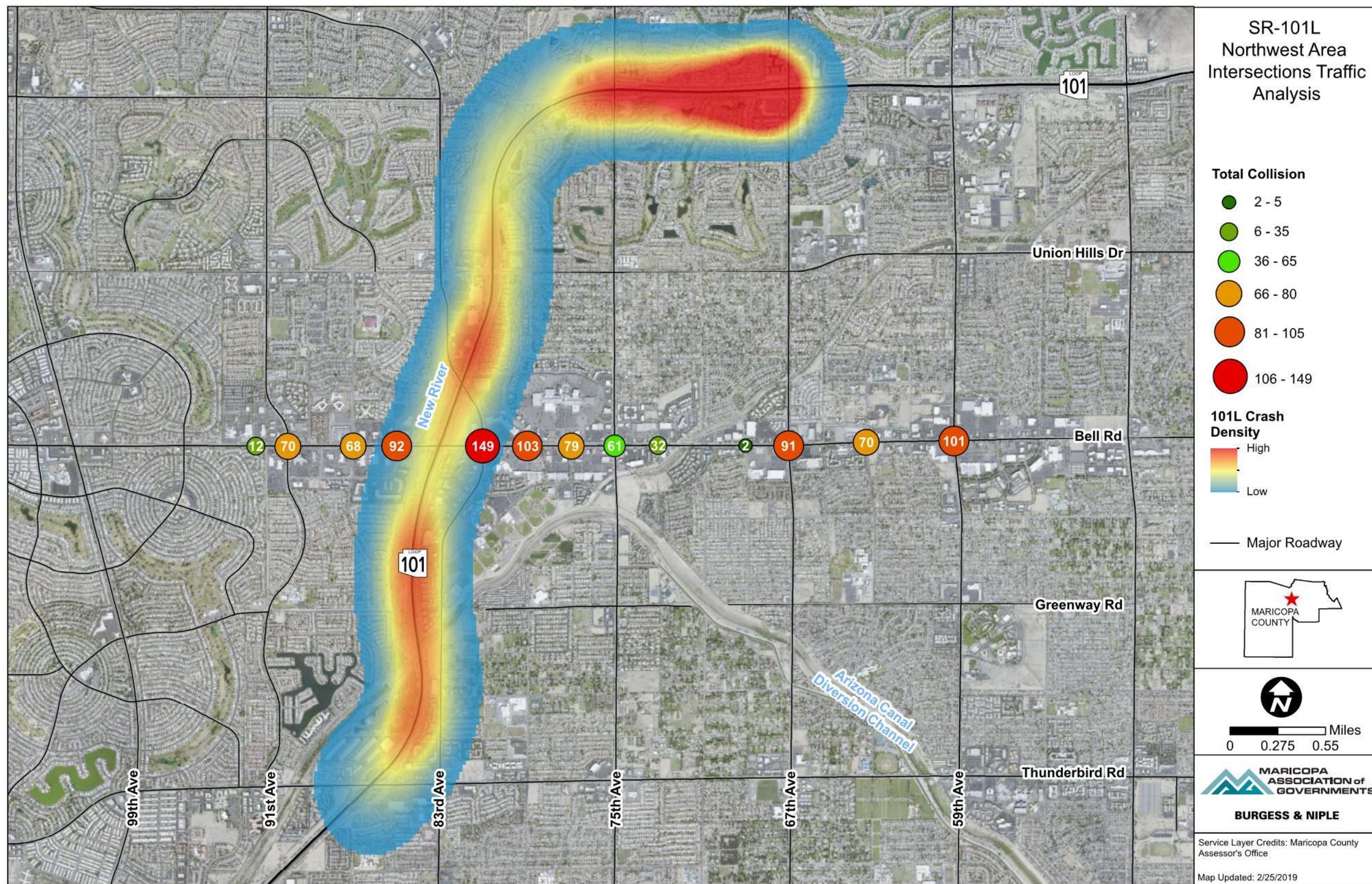


Table 4 – SR-101L TIs Collision Manner by TI

| TI | Collision Manner | | | | | | | | | | | | | |
|---------------------------------|------------------|-------|-----------|----------|---------|----------------------------|--------------------------------|--------------|--------------|------------|---------|--------|---------|-------|
| | Single Vehicle | Angle | Left-Turn | Rear End | Head On | Sideswipe (Same Direction) | Sideswipe (Opposite Direction) | Rear to Side | Rear to Rear | Pedestrian | Bicycle | Other* | Unknown | Total |
| Thunderbird Rd & SR-101L | 4 | 7 | 21 | 28 | 2 | 10 | 1 | | | 1 | | 1 | | 75 |
| Bell Rd & SR-101L | 16 | 14 | 8 | 60 | | 23 | | | | | | 3 | | 124 |
| Union Hills Dr & SR-101L | 4 | 20 | 13 | 33 | 1 | 10 | 1 | | | | | | | 82 |
| 75th Ave & SR-101L ¹ | 13 | 5 | 12 | 49 | | 10 | | | | 1 | 1 | 1 | | 92 |
| 67th Ave & SR-101L ¹ | 3 | 42 | 23 | 59 | | 27 | 1 | | | 1 | | 2 | | 157 |

*Does not include pedestrian or bicycle crashes.

5.2 SR-101L Mainline Safety Analysis

Within the five-year period, 1,118 crashes occurred on SR-101L mainline segments within the Study Area. Of those, 4 were fatal and 20 were incapacitating. **Table 5** lists the crashes by injury severity along SR-101L segments, listed from south to north. Segments listed as "Thunderbird Rd", for example, refer to the mainline segment between the on and off ramps serving that arterial—in this case, Thunderbird Road.

Table 5 – SR-101L: Injury Severity by Segment

| Segment | Fatal | Incapacitating | Non-incapacitating Injury | Possible Injury | No Injury | Total |
|----------------------------|-------|----------------|---------------------------|-----------------|-----------|-------|
| Thunderbird Rd | 0 | 3 | 15 | 17 | 71 | 106 |
| Thunderbird Rd to Bell Rd | 2 | 5 | 30 | 18 | 142 | 197 |
| Bell Rd | 0 | 0 | 5 | 10 | 50 | 65 |
| Bell Rd to Union Hills Dr | 0 | 2 | 8 | 7 | 43 | 60 |
| Union Hills Dr | 0 | 1 | 11 | 6 | 41 | 59 |
| Union Hills Dr to 75th Ave | 1 | 1 | 6 | 8 | 47 | 63 |
| 75th Ave | 0 | 3 | 19 | 19 | 86 | 127 |
| 75th Ave to 67th Ave | 0 | 1 | 13 | 11 | 66 | 91 |
| 67th Ave | 1 | 4 | 38 | 52 | 255 | 350 |
| Total | 4 | 20 | 145 | 148 | 801 | 1118 |

Over the five-year period, two fatalities occurred between Thunderbird Road and Bell Road, one fatality occurred between Union Hills Drive and 75th Avenue, and one fatality occurred between the 67th Avenue on and off ramp gores. 67th Avenue experienced the most crashes overall within the Study Area, but the segment between Thunderbird Road and Bell Road experienced the most incapacitating crashes. **Table 6** lists SR-101L Study Area segments by collision manner.

Table 6 – SR-101L Mainline Collision Manner by Segment

| Segment | Collision Manner | | | | | | | | | | | | | Total |
|----------------------------|------------------|-------|-----------|----------|---------|----------------------------|--------------------------------|--------------|--------------|------------|---------|--------|---------|-------|
| | Single Vehicle | Angle | Left-Turn | Rear End | Head On | Sideswipe (Same Direction) | Sideswipe (Opposite Direction) | Rear to Side | Rear to Rear | Pedestrian | Bicycle | Other* | Unknown | |
| Thunderbird Rd | 30 | 2 | | 48 | | 19 | | | | | | 7 | | 106 |
| Thunderbird Rd to Bell Rd | 79 | 4 | | 71 | | 26 | 1 | | | 1 | | 15 | | 197 |
| Bell Rd | 33 | 1 | | 16 | | 11 | | | | | | 4 | | 65 |
| Bell Rd to Union Hills Dr | 16 | 2 | | 27 | | 14 | | 1 | | | | | | 60 |
| Union Hills Dr | 23 | 2 | | 19 | | 10 | | | | | | 5 | | 59 |
| Union Hills Dr to 75th Ave | 20 | 4 | | 18 | | 6 | | | | | | 6 | | 63 |
| 75th Ave | 39 | 2 | | 68 | | 15 | | 1 | | | | 2 | | 127 |
| 75th Ave to 67th Ave | 15 | | | 58 | | 14 | 1 | 8 | | | | 2 | | 91 |
| 67th Ave | 25 | 3 | | 268 | 2 | 43 | | 1 | | | | 8 | | 350 |

*Does not include pedestrian or bicycle crashes.

Rear end crashes accounted for approximately half of all crashes that occurred on SR-101L segments within the Study Area (593 of 1,118 total crashes). The segment between the on and off ramp gores serving 67th Avenue had the highest number of rear end and same-direction sideswipe crashes, crash types typically associated with congestion on freeways. The segment between Thunderbird Road and Bell Road had the most single vehicle crashes, which was the most represented crash type along this segment.

The single pedestrian crash along SR-101L occurred between Thunderbird Road and Bell Road. The crash record did not include any information on the pedestrian activity at the time of the collision.

Table 7 presents crashes along SR-101L listed by fatal or incapacitating injuries and collision manner.

Table 7 – SR-101L: Injury Severity and Collision Manner

| Collision Manner | Fatal | Incapacitating |
|----------------------------|-------|----------------|
| Single Vehicle | 3 | 6 |
| Rear End | 1 | 9 |
| Sideswipe (same direction) | 0 | 4 |
| Other | 0 | 1 |
| Total | 4 | 20 |

Three of the four fatal crashes occurred in single-vehicle crashes. Nine of the incapacitating crashes were rear end crashes, as well as the fourth fatality. These were the two most common crash types for all SR-101L segments, which is typical for divided highways. Rear end crashes, in particular, tend to be more prevalent along segments with more congestion due to the stop-and-go nature of traffic. This may account for the high number of rear-end crashes on SR-101L between the 67th Avenue on and off ramps.

5.3 Bell Road Intersection Safety Analysis

Within the five-year period, 930 crashes occurred on Bell Road at intersections within the Study Area. Two crashes were fatal; 23 were incapacitating. **Table 8** breaks down the crashes at these intersections by injury severity, with intersections listed from west to east.

Table 8 – Bell Road: Injury Severity by Intersection

| Intersection | Fatal | Incapacitating | Non-incapacitating Injury | Possible Injury | No Injury | Total |
|---------------------|--------------|-----------------------|----------------------------------|------------------------|------------------|--------------|
| 92nd Ave | 0 | 1 | 0 | 3 | 8 | 12 |
| 91st Ave | 0 | 4 | 15 | 12 | 39 | 70 |
| 87th Ave | 0 | 3 | 10 | 8 | 47 | 68 |
| 84th Ave | 0 | 4 | 7 | 15 | 66 | 92 |
| 83rd Ave | 0 | 0 | 3 | 28 | 118 | 149 |
| 79th Ave | 0 | 1 | 6 | 29 | 67 | 103 |
| 77th Ave | 0 | 1 | 3 | 23 | 52 | 79 |
| 75th Ave | 1 | 5 | 6 | 12 | 37 | 61 |
| 73rd Ave | 0 | 0 | 1 | 6 | 25 | 32 |
| 69th Ave | 0 | 0 | 0 | 2 | 0 | 2 |
| 67th Ave | 0 | 1 | 8 | 17 | 65 | 91 |
| 63rd Ave | 1 | 1 | 4 | 15 | 49 | 70 |
| 59th Ave | 0 | 2 | 6 | 26 | 67 | 101 |
| Total | 2 | 23 | 69 | 196 | 640 | 930 |

One fatal crash occurred each at the 75th Avenue and 63rd Avenue intersections within the five-year period. The most incapacitating crashes occurred at 91st Avenue, while the most total crashes occurred at 83rd Avenue. **Table 9** lists the crashes at Bell Road Study Area intersections by collision manner.

Per request by the city of Glendale, crash rates were calculated for intersections along Bell Road at which traffic counts were collected. The rates are included as **Appendix E** using crash data provided by the city of Glendale, as available, and MAG data for the remaining intersections. Along Bell Road, the 59th Avenue intersection had the highest crash rate (1.31), followed by 67th Avenue (1.08). 79th Avenue and 83rd Avenue were tied for third highest crash rate (0.94).

Table 9 – Bell Road Collision Manner by Intersection

| Intersection | Collision Manner | | | | | | | | | | | | | |
|--------------|------------------|-------|-----------|----------|---------|----------------------------|--------------------------------|--------------|--------------|------------|---------|--------|---------|-------|
| | Single Vehicle | Angle | Left-Turn | Rear End | Head On | Sideswipe (Same Direction) | Sideswipe (Opposite Direction) | Rear to Side | Rear to Rear | Pedestrian | Bicycle | Other* | Unknown | Total |
| 92nd Ave | 1 | | | 11 | | | | | | | | | | 12 |
| 91st Ave | 1 | 6 | 26 | 31 | | 3 | | | 1 | | | 1 | 1 | 70 |
| 87th Ave | | 6 | 7 | 51 | | 2 | 1 | | | | 1 | | | 68 |
| 84th Ave | | 12 | 16 | 55 | | 9 | | | | | | | | 92 |
| 83rd Ave | 4 | 18 | 18 | 74 | 1 | 30 | | | | | 1 | 2 | 1 | 149 |
| 79th Ave | 1 | 11 | 10 | 67 | | 12 | | | | | 1 | | 1 | 103 |
| 77th Ave | | 7 | 16 | 50 | | 5 | | | | | 1 | | | 79 |
| 75th Ave | | 4 | 4 | 35 | 2 | 11 | | | | 2 | 2 | | | 61 |
| 73rd Ave | 2 | 4 | 10 | 12 | | 4 | | | | | | | | 32 |
| 69th Ave | 1 | | | 1 | | | | | | | | | | 2 |
| 67th Ave | 1 | 12 | 28 | 37 | 1 | 8 | | | | 2 | 1 | | 1 | 91 |
| 63rd Ave | 2 | 11 | 12 | 33 | | 8 | | | | 1 | 2 | 1 | | 70 |
| 59th Ave | 4 | 14 | 24 | 43 | 1 | 12 | | | | 2 | | 1 | | 101 |

*Does not include pedestrian or bicycle crashes.

Within the five-year period, rear end crashes accounted for more than half of all crashes that occurred on Bell Road within the Study Area (500 of 930 total crashes). The next most frequent cause of crashes was left-turn crashes, accounting for 171 crashes. The intersection of Bell Road and 83rd Avenue experienced the most crashes of the thirteen intersections in the Study Area (149 crashes), followed by 79th Avenue and 59th (103 and 101 crashes, respectively). 69th Avenue had the least number of crashes, with only 2 crashes over the five-year period. **Table 10** summarizes the number of fatal and incapacitating crashes by collision manner.

Table 10 – Bell Road: Injury Severity and Collision Manner

| Collision Manner | Fatal | Incapacitating |
|----------------------------|--------------|-----------------------|
| Angle | 2 | 1 |
| Left-Turn | 0 | 11 |
| Rear End | 0 | 5 |
| Sideswipe (same direction) | 0 | 1 |
| Other | 0 | 1 |
| Pedestrian | 0 | 2 |
| Bicycle | 0 | 2 |
| Total | 2 | 23 |

Left-turn crashes accounted for the most incapacitating crashes at Bell Road Study Area intersections, followed by rear end crashes. Angle crashes were the cause of both fatal crashes. The number of access points along Bell Road, shown in **Figure 4.3**, may be a factor contributing to the number of left-turn and angle crashes which have occurred, as drivers attempt to access the businesses against the incoming flow of traffic.

Pedestrian and bicycle crashes tend to be of higher severity than other crash types and are of particular focus in Arizona. **Table 11** breaks down the pedestrian and bicyclist crashes along Bell Road by intersection.

Table 11 – Bell Road: Pedestrian and Bicycle Crashes by Severity and Intersection

| Intersection | Fatal | Incapacitating | Non-incapacitating Injury | Possible Injury | No Injury | Total |
|---------------------|--------------|-----------------------|----------------------------------|------------------------|------------------|--------------|
| 92nd Ave | 0 | 0 | 0 | 0 | 0 | 0 |
| 91st Ave | 0 | 0 | 0 | 0 | 0 | 0 |
| 87th Ave | 0 | 0 | 1 | 0 | 0 | 1 |
| 84th Ave | 0 | 0 | 0 | 0 | 0 | 0 |
| 83rd Ave | 0 | 0 | 0 | 1 | 0 | 1 |
| 79th Ave | 0 | 0 | 0 | 1 | 0 | 1 |
| 77th Ave | 0 | 0 | 0 | 0 | 1 | 1 |
| 75th Ave | 0 | 4 | 0 | 0 | 0 | 4 |
| 73rd Ave | 0 | 0 | 0 | 0 | 0 | 0 |
| 69th Ave | 0 | 0 | 0 | 0 | 0 | 0 |
| 67th Ave | 0 | 0 | 1 | 2 | 0 | 3 |
| 63rd Ave | 0 | 0 | 0 | 2 | 1 | 3 |
| 59th Ave | 0 | 0 | 0 | 2 | 1 | 3 |
| Total | 0 | 4 | 2 | 8 | 3 | 17 |

There were no fatal pedestrian or bicycle-related crashes on Bell Road in the Study Area over the five-year period. However, there were four incapacitating pedestrian or bicycle-related crashes. Of the 17 pedestrian- and bicycle-related crashes, 11 occurred in daylight conditions. The most pedestrian- or bicycle-related crashes occurred at 75th Avenue; all were incapacitating and all occurred in the daytime. 75th Avenue is located at the east side of the Arrowhead Towne Center mall, bordered on all sides by restaurants and large stores. 83rd Avenue, 79th Avenue, and 77th Avenue are also adjacent to the Arrowhead Towne Center complex; each had one pedestrian or bicycle crash during the five-year period.

67th Avenue, 63rd Avenue, and 59th Avenue had the second-most bicycle and pedestrian crashes, with three crashes each. The 59th Avenue intersection is surrounded by commercial properties, which are part of the Talavi Town Center. The 67th Avenue intersection is surrounded by commercial properties on a more limited scale than 59th Avenue, including a bank and grocery store, bordered closely by residential neighborhoods. 63rd Avenue is surrounded by a mix of smaller commercial properties, including two auto repair centers, and residential communities.

6.0 Existing and Future Traffic Analysis

An existing (2018) and future (2040) no-build conditions analysis was performed for the Study Area using a combination of modeling techniques. Synchro software was used to assess the operations of the Study Area intersections along Bell Road and the SR-101L TIs, including the Bell Road SPUI. PTV Vissim and Visum software was used to develop micro- and macrosimulation models for the Study Area, respectively. The models played an important role towards providing a complete description of traffic patterns within the Study Area for existing and future years, including estimating counts at intersections for which count data was not available and assessing intersection and segment operations. The analysis methodology, models, and results of the analysis are described below.

6.1 Methodology

MAG data was obtained for the Study Area for existing (2018) and future year (2040) scenarios. The data provided the existing and future ADT volumes for traffic forecasting, a process which provides calibrated future ADT volumes and turning movement counts for the peak a.m. and p.m. periods. Preliminary Origin-Destination (OD) matrices were developed for a.m. and p.m., existing and future time periods using existing and forecasted turning movement counts.

A microscopic model of the Study Area network was constructed using PTV Vissim software. This model was imported into the macroscopic modeling platform, Visum, and calibrated for existing and future scenarios using existing and forecasted turning movement counts and preliminary OD matrices through a process known as matrix estimation. The macroscopic model was used to: 1) Generate turning movement volumes at locations without traffic count information for both existing and future year scenarios and 2) Refine existing and future OD matrices. Turning movement volumes were exported to Synchro for a Level of Service (LOS) analysis of Study Area SR-101L TIs and intersections. Calibrated OD matrices were imported into the microscopic model for further assessment of segment, intersection, and network-wide operations. The microscopic model was verified and supplemented with a high-level Highway Capacity Software (HCS) analysis. Each model is discussed in more detail in the following sections.

6.1.1 MAG Travel Demand Model

The MAG Travel Demand Model (TDM) was a critical tool to this Study for the development of future ADT projections and refined future turning volumes. The MAG TDM is a regional 4-step model maintained by MAG and developed using TransCAD modeling software. The Study Area lies completely within the MAG TDM.

A TDM is often referred to as a “regional” model because the roadway network it represents typically spans multiple jurisdictions. TDMs are extensively calibrated and rooted in survey-informed population, employment, and socioeconomic data—all of which influence trip generation and mode choice. The MAG model has a land use component that includes socioeconomic information in the region disaggregated by TAZ. Each TAZ in the region includes information about housing, population and employment. Land use estimates for the future are generally derived from Census data and regional estimates associated with improvements. To develop the future year land use data, MAG utilizes the land use elements of adopted general/comprehensive plans for cities and towns in the region. Future year MAG models also include programmed and funded roadway improvements in the region. Therefore, model traffic projections account for planned improvements, new developments, and land use changes expected by a specified horizon year.

6.1.2 Traffic Forecasting

Future ADT and turning movement volumes for the Study Area were projected using forecasting methodology presented in NCHRP 765 Report: Analytical Travel Forecasting Approaches for Project-Level Planning and Design. The report and procedures outlined in the NCHRP 765 report largely derive from and improve upon the procedures outlined in a prior NCHRP publication, Report 255: Highway Traffic Data for Urbanized Planning and Design. The specific procedure used in the current study is an iterative turning movement estimation method and uses the combined Factoring Procedures for Ratio and Difference Methods in the NCHRP 765 Report.

The inputs required for post-processing model estimates using this method are:

1. Base year traffic counts;
2. Base year regional TDM estimates;
3. Future year regional TDM forecasts; and
4. Design hour 30th highest K-factor.

The procedure adjusts the model forecasted link volumes using a combination of Ratio and Difference Methods and subsequently uses an iterative method to determine future turning movement volumes using existing turning movement counts as a basis. A tolerance of 10 percent was used to determine the convergence of the iterative method. The iterative process is designed to minimize the errors identified in the existing year model estimates when compared to the observed traffic counts.

6.1.3 Synchro Model

A Synchro (Version 10.0) model was developed to provide a LOS analysis of Study Area intersections along Bell Road and Study Area TIs along SR-101L. The following sections discuss the LOS analysis process and the factors that determine LOS.

Level of Service Analysis

LOS is a qualitative measure of how well an intersection or roadway segment operates on a graded scale of A (best) to F (worst). LOS considers a variety of factors, including stability of traffic flow, opportunity for passing, and driver comfort. Operations of LOS D and better are typically considered acceptable in urban settings. Operations of LOS E or F may be flagged for improvement.

For intersection and TI analysis, LOS is determined using the total delay, in seconds, of vehicles which approach the intersection over the course of one traffic signal cycle. Intersections within the Study Area were analyzed using the LOS thresholds shown in **Table 12**.

Table 12 – LOS Thresholds for Signalized Intersections

| Control Delay | Level of Service |
|-----------------|------------------|
| ≤ 10 seconds | A |
| 10 – 20 seconds | B |
| 20 – 35 seconds | C |
| 35 – 55 seconds | D |
| 55 – 80 seconds | E |
| > 80 seconds | F |

The LOS analysis was conducted using Synchro's built-in methodology. While Highway Capacity Manual (HCM) 6th edition methodology is most commonly used to assess intersection LOS, it cannot assess intersections with unique signal timing and geometric configurations. Specifically, HCM 6th edition methodology cannot assess TIs modeled as clustered intersections. Synchro was used to for TIs as it accounts for the combined operation and close proximity of ramp terminals. For consistency, all results presented in this report were generated using Synchro's built-in methodology.

Intersection Geometry

Lane configuration, the number of lanes allocated to through and turning movements for each intersection approach, is one key determinant of intersection LOS. The existing conditions Synchro model for the Bell Road Study Area intersections was developed using aerial imagery. The lane configuration of each intersection in the existing

conditions Synchro model matches the lane configuration of each intersection. Lane configurations for the future analysis match those of the existing conditions analysis, representing a “future no-build” condition.

Traffic Volumes

The Synchro models developed for the a.m. and p.m. existing condition scenarios use actual count volumes where available. For future condition scenarios, locations at which counts were collected use traffic volumes forecasted directly from the counts, projected using NCHRP 765 methodology. At the remaining locations, the existing and future Synchro models use counts developed with the modeling techniques described in **Section 6.1.6**. Truck percentages and peak hour factor were modeled as two percent and 0.92, respectively.

Traffic Signal Timing

All intersections within the Study Area were analyzed as actuated-coordinated intersections. For existing conditions, Study Area TIs along SR-101L were timed in Synchro using the signal timing plans and phasing diagrams provided by ADOT.

Study Area intersections along Bell Road were optimized as an approximation of the unique adaptive signal system, Rhythm In|Sync, currently implemented along the Bell Road corridor. The Rhythm software is proprietary and the necessary information to construct a full-scale microsimulation model to assess the operations of the Bell Road adaptive signal system was not available. Synchro optimization represents an acceptable alternative for assessing the operations of intersections along Bell Road.

To approximate operations along Bell Road, signals were optimized to use cycle lengths between 90 and 120 seconds and incorporated pedestrian phasing, where reasonable. Red and yellow intervals were calculated based on the posted speed limit and geometric configuration of each intersection. Signals were coordinated based on existing splits, assuming coordination along Bell Road.

All signals, including those at TIs along SR-101L, were optimized for future conditions scenarios. For SR-101L TIs, a separate Synchro analysis was performed to assess operations using existing timings with future volumes. This is discussed further in **Section 6.3.1**.

In the future condition, signal optimization at the TIs was performed following a similar process to that used for existing conditions along Bell Road. However, the TIs were optimized as isolated intersections and not as part of a network. Optimizing a TI as an isolated intersection does not capture the effects of metering, queue spillback and

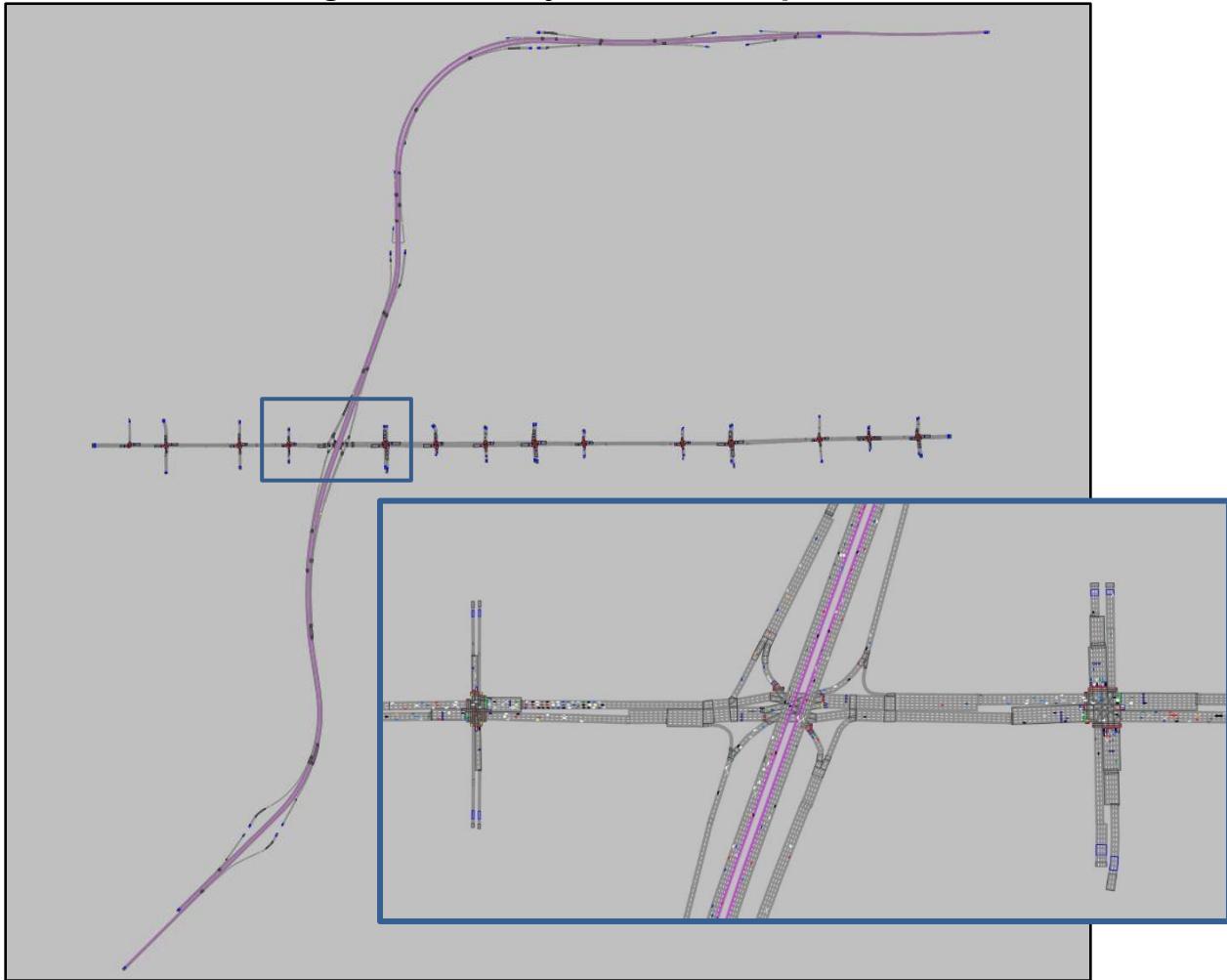
corridor progression on signal operations at the TI—effects which can significantly impact operations. The analysis of the TIs as part of a larger network, however, was beyond the scope of this project.

6.1.4 Highway Capacity Software (HCS) Modeling

HCS was used to assess the operational performance of SR-101L mainline segments for the future year a.m. and p.m. peak hour scenarios. The future year scenario includes an extra lane in each direction of travel along SR-101L, which is anticipated to be constructed by 2040. The analysis supplements the detailed microsimulation modeling analysis performed for the same scenarios in two ways: it is a check on the microsimulation model and a high-level assessment of corridor performance. Because HCS analysis is high-level, it does not capture the full picture of corridor operations that microsimulation analysis can—for example, the operational impacts of lane utilization and queueing.

6.1.5 Microsimulation Model

A microsimulation model was developed for the project Study Area using PTV Vissim (Version 10) software to provide a detailed assessment of traffic patterns in the Study Area. A microsimulation model is a detailed model, able to depict lanes, turn bays, parking, crosswalks, ramp meters, signals, and other physical characteristics of a network as one might see them in aerial imagery. It also allows the user to fine-tune a wide range of non-physical characteristics of the network, including signal timing, priority, and speed decisions. **Figure 6.1** provides a snapshot of the microscopic model constructed for this analysis, with a close-up of the Bell Road and SR-101L TI. The same signal timing plans used in Synchro, discussed in **Section 6.1.3**, were implemented in this microsimulation model. The microsimulation model was run for existing a.m. and p.m. and future a.m. and p.m. scenarios using Vissim's dynamic assignment protocol in conjunction with refined OD matrices developed in Visum (**Section 6.1.6**). While the existing scenario reflected existing network conditions, the future conditions scenario was updated to include programmed future projects, including an additional general-purpose lane along SR-101L and additional ramp metering.

Figure 6.1 – Study Area Microscopic Model


6.1.6 Macrosimulation Model

A macrosimulation model was constructed for the Study Area using PTV Visum (Version 17) software. This model provided estimated turning movement counts for existing and future conditions at locations for which counts were not available. It also provided refined OD matrices, necessary for the dynamic assignment procedure used in the microsimulation model, calibrated through matrix estimation techniques.

Macrosimulation models contain significantly less detail than microsimulation models: intersections (called “nodes”) are represented as dots; segments (called “links”), the connecting roadways between intersections, are represented by lines. Nodes and links can have attributes for the user to input specific characteristics of each element. While a macrosimulation model can quickly perform the iterations necessary to determine vehicle routing behavior and turning movement estimations, it does not yield the level

of detail for an assessment of operations that microsimulation modeling can. Therefore, both types of models are used together to achieve efficient, accurate assessment.

Network Characteristics

The existing Study Area microsimulation model created in Vissim was imported into Visum and refined for a macrosimulation analysis. For roadway segments with available counts, a.m. and p.m. peak hour counts were assigned as attributes to those segments. For intersections with available turning movement counts, a.m. and p.m. peak hour counts were assigned as attributes to those turning movements for both existing and future conditions. For future conditions, the existing Study Area network was updated to include a planned additional general-purpose lane along SR-101L. No other planned improvements were incorporated into the future macrosimulation model, as they are not expected to impact model output.

Matrix Estimation

Both turning movement counts and segment counts were used to calibrate Study Area OD matrices using a process called "matrix estimation." For this process, tolerances of 10 percent and 20 percent are assigned to segment counts and turning movement counts, respectively, based on existing count values. The matrix estimation process uses a seed matrix, constructed and estimated based on known volumes entering and exiting the Study Area, traffic counts and tolerances to develop a calibrated OD matrix for the Study Area. The process of OD-matrix estimation (or matrix calibration) converges when the traffic assignment using the estimated matrices results in a good correlation with observed traffic counts. This procedure was performed for both existing and future conditions. For future conditions, NCHRP-forecasted count volumes were used to calibrate the matrix. Using the estimated matrices, Visum assigns traffic volumes and turning movement counts throughout the Study Area. This process is useful for estimating counts at locations where counts were not collected and for refining initial OD matrices.

The correlation between the NCHRP-forecasted 2040 volumes and model-estimated volumes is shown for segments (links) in **Figure 6.2** and for turns in **Figure 6.3** for the p.m. peak hour. Model-estimated volumes are on the Y-axis; 2040 NCHRP-forecasted volumes are on the X-axis. The line $y=x$ represents a perfect 1 to 1 correlation between the forecasted volumes and model-estimated volumes. The goal of matrix estimation is to achieve segment and turning movement counts which conform to this line as closely as possible.

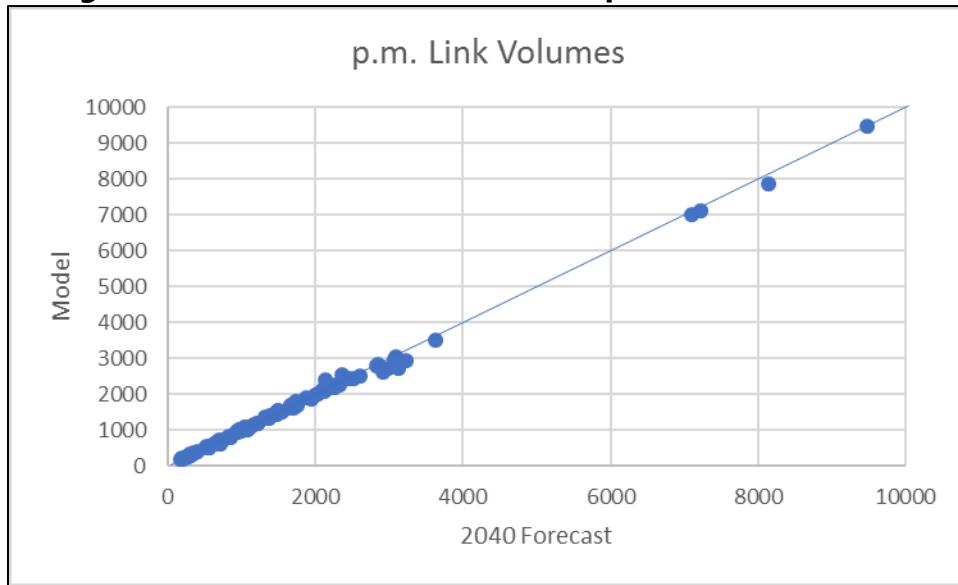
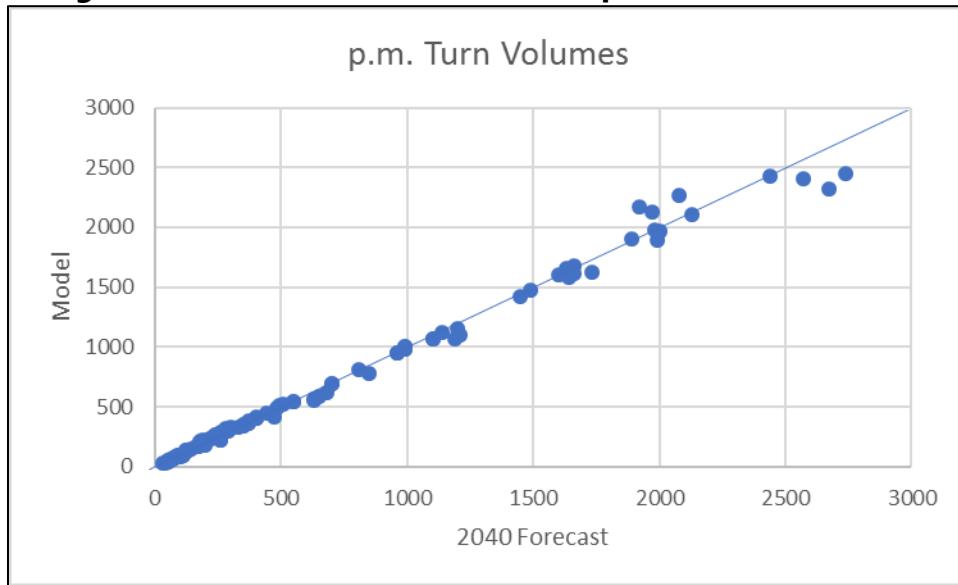
Figure 6.2 – Matrix Estimation: 2040 p.m. Link Correlation

Figure 6.3 – Matrix Estimation: 2040 p.m. Turn Correlation


Figure 6.2 and **Figure 6.3** show matrix calibration resulted in a relatively good correlation between NCHRP-forecasted volumes and model-estimated volumes for the 2040 p.m. peak hour. Tests performed for the 2040 a.m. peak hour and existing peak hours yielded similar results.

6.2 Existing (2018) Conditions Analysis Results

A capacity analysis of existing conditions was performed for the Study Area using a combination of modeling techniques, discussed in **Section 6.1**. The results of this

analysis are divided into the two distinct corridors comprising the Study Area: SR-101L and Bell Road. Select results are also presented for the network as a whole. For the purpose of this Study, LOS D and above was considered acceptable. Intersections and segments performing at LOS E or LOS F warrant consideration for potential improvement. Synchro reports are included in **Appendix C**.

6.2.1 SR-101L Existing Capacity Analysis

A Synchro analysis assessing TI operations along SR-101L was performed for TIs within the Study Area extents for the a.m. and p.m. peak hours. The results of this analysis are presented in **Table 13**, with delay, LOS, and queue length broken out by intersection approach and TIs listed in order from south to north. Intersections and intersection approaches that operate at LOS E are highlighted in orange; those operating at LOS F are highlighted in red.

Table 13 – SR-101L TIs Existing (2018) Capacity Analysis Results

| Intersection ¹ | Approach | a.m. Peak Hour | | | p.m. Peak Hour | | |
|---|----------|----------------|----------|-------------------|----------------|----------|-------------------|
| | | Delay (s) | LOS | 95th % Queue (ft) | Delay (s) | LOS | 95th % Queue (ft) |
| (1) Thunderbird Road & SB SR-101L | EB | 25.7 | C | 212 | 29.9 | C | 292 |
| | WB | 41.1 | D | 300 ² | 56.3 | E | 555 ² |
| | NB | N/A | N/A | N/A | N/A | N/A | N/A |
| | SB | 18.8 | B | 297 | 30.7 | C | 355 |
| | Overall | 30.9 | C | N/A | 41.7 | D | N/A |
| (2) Thunderbird Road & NB SR-101L | EB | 33.4 | C | 198 | 39.3 | D | 327 |
| | WB | 32.1 | C | 252 | 40.6 | D | 428 |
| | NB | 49.5 | D | 853 ² | 29.6 | C | 651 ² |
| | SB | N/A | N/A | N/A | N/A | N/A | N/A |
| | Overall | 38.8 | D | N/A | 37.5 | D | N/A |
| (3) Bell Road & SR-101L | EB | 36.6 | D | 422 | 47.5 | D | 456 ² |
| | WB | 46.1 | D | 267 | 49.9 | D | 472 ² |
| | NB | 60.4 | E | 317 | 57.6 | E | 254 ² |
| | SB | 44.8 | D | 136 | 49.6 | D | 177 |
| | Overall | 43.0 | D | N/A | 49.6 | D | N/A |
| (4) Union Hills Drive & SB SR-101L | EB | 30.0 | C | 230 | 34.2 | C | 272 |
| | WB | 55.0 | D | 399 ² | 283.4 | F | 970 ² |
| | NB | N/A | N/A | N/A | N/A | N/A | N/A |
| | SB | 11.0 | B | 106 | 7.6 | A | 87 |
| | Overall | 35.9 | D | N/A | 151.5 | F | N/A |
| (5) Union Hills Drive & NB SR-101L | EB | 42.8 | D | 251 | 48.8 | D | 318 ² |
| | WB | 34.7 | C | 114 | 58.3 | E | 289 |
| | NB | 19.0 | B | 273 | 27.8 | C | 452 |
| | SB | N/A | N/A | N/A | N/A | N/A | N/A |
| | Overall | 33.4 | C | N/A | 46.3 | D | N/A |

| Intersection ¹ | Approach | a.m. Peak Hour | | | p.m. Peak Hour | | |
|---------------------------------|----------|----------------|-----|-------------------|----------------|----------|-------------------|
| | | Delay (s) | LOS | 95th % Queue (ft) | Delay (s) | LOS | 95th % Queue (ft) |
| (6) 75th Avenue & WB SR-101L | EB | N/A | N/A | N/A | N/A | N/A | N/A |
| | WB | 19.7 | B | 283 | 42.1 | D | 486 |
| | NB | 36.4 | D | 221 | 32.8 | C | 302 |
| | SB | 110.2 | F | 568 ² | 37.0 | D | 283 |
| | Overall | 71.1 | E | N/A | 37.7 | D | N/A |
| (7) 75th Avenue & EB SR-101L | EB | 40.8 | D | 218 | 30.1 | C | 269 |
| | WB | N/A | N/A | N/A | N/A | N/A | N/A |
| | NB | 36.1 | D | 163 | 32.1 | C | 252 |
| | SB | 118.3 | F | 761 ² | 70.2 | E | 485 ² |
| | Overall | 87.0 | F | N/A | 50.1 | D | N/A |
| (8) 67th Avenue & WB SR-101L | EB | N/A | N/A | N/A | N/A | N/A | N/A |
| | WB | 44.2 | D | 371 ² | 144.5 | F | 768 ² |
| | NB | 95.6 | F | 502 ² | 139.2 | F | 760 ² |
| | SB | 23.2 | C | 320 | 33.3 | C | 257 |
| | Overall | 46.6 | D | N/A | 108.9 | F | N/A |
| (9) 67th Avenue & EB SR-101L | EB | 43.4 | D | 281 | 62.2 | E | 525 ² |
| | WB | N/A | N/A | N/A | N/A | N/A | N/A |
| | NB | 47.1 | D | 380 ² | 34.9 | C | 248 |
| | SB | 38.1 | D | 402 | 66.0 | E | 492 ² |
| | Overall | 41.5 | D | N/A | 55.7 | E | N/A |

¹Refer to **Figure 4.4** for the intersection number.

²Approximation from Synchro analysis due to upstream metering or volume exceeding capacity

In general, all TIs except the Bell Road and Thunderbird Road TIs, operate below an acceptable overall LOS in existing conditions.

6.2.2 Bell Road Existing Capacity Analysis

A Synchro analysis assessing intersection operations along Bell Road was performed for intersections within the Study Area extents for the a.m. and p.m. peak hours. The results of this analysis are presented in **Table 14**, with delay and LOS broken out by intersection approach and intersections listed in order from west to east. Intersections and approaches to intersections that operate at LOS E are highlighted in orange; those operating at LOS F are highlighted in red. Intersections with a "2" next to the name were analyzed using model-estimated counts.

Table 14 – Bell Road Intersection Existing (2018) Capacity Analysis Results

| Intersection ¹ | Approach | A.M. Peak Hour | | | P.M. Peak Hour | | |
|---------------------------------|----------|----------------|----------|-------------------|----------------|----------|-------------------|
| | | Delay (s) | LOS | 95th % Queue (ft) | Delay (s) | LOS | 95th % Queue (ft) |
| 92nd Ave & Bell Rd ² | EB | 10.6 | B | 344 | 9.2 | A | 205 |
| | WB | 2.3 | A | 69 | 12.9 | B | 453 |
| | NB | N/A | N/A | N/A | N/A | N/A | N/A |
| | SB | 47.5 | D | 241 | 40.9 | D | 241 ³ |
| | Overall | 9.9 | A | N/A | 13.3 | B | N/A |
| [1] 91st Ave & Bell Rd | EB | 27.0 | C | 259 ³ | 35.3 | D | 504 |
| | WB | 30.0 | C | 380 | 50.8 | D | 765 ³ |
| | NB | 24.7 | C | 100 | 46.4 | D | 193 ³ |
| | SB | 35.0 | D | 219 ³ | 50.3 | D | 249 ³ |
| | Overall | 28.8 | C | N/A | 44.7 | D | N/A |
| [2] 87th Ave & Bell Rd | EB | 25.8 | C | 732 | 19.6 | B | 454 |
| | WB | 15.5 | B | 362 | 18.3 | B | 567 |
| | NB | 24.6 | C | 69 | 26.1 | C | 105 |
| | SB | 48.5 | D | 179 ³ | 34.6 | C | 135 |
| | Overall | 22.6 | C | N/A | 19.9 | D | N/A |
| 84th Ave & Bell Rd ² | EB | 45.0 | D | 840 ³ | 32.6 | C | 604 |
| | WB | 28.8 | C | 539 | 26.2 | C | 830 ³ |
| | NB | 23.8 | C | 37 | 24.8 | C | 142 |
| | SB | 27.9 | C | 48 | 57.1 | E | 191 ³ |
| | Overall | 37.2 | D | N/A | 29.7 | C | N/A |
| [3] 83rd Ave & Bell Rd | EB | 38.4 | D | 503 | 47.6 | D | 322 |
| | WB | 2.3 | C | 164 | 82.1 | F | 649 ³ |
| | NB | 44.1 | D | 146 | 59.3 | E | 319 |
| | SB | 43.2 | D | 152 | 57.0 | E | 358 ³ |
| | Overall | 38.7 | D | N/A | 63.0 | E | N/A |
| [4] 79th Ave & Bell Rd | EB | 19.6 | B | 364 | 30.8 | C | 320 |
| | WB | 19.2 | B | 145 | 18.6 | B | 253 |
| | NB | 30.5 | C | 25 | 29.9 | C | 144 |
| | SB | 18.6 | B | 55 | 30.1 | C | 234 |
| | Overall | 19.5 | B | N/A | 25.3 | C | N/A |
| [5] 77th Ave & Bell Rd | EB | 22.4 | C | 289 | 21.0 | C | 408 |
| | WB | 24.0 | C | 160 | 31.4 | C | 417 |
| | NB | 24.5 | C | 37 | 30.9 | C | 182 |
| | SB | 14.9 | B | 23 | 25.6 | C | 143 |
| | Overall | 22.9 | C | N/A | 26.8 | C | N/A |
| [6] 75th Ave & Bell Rd | EB | 32.7 | C | 336 | 43.7 | D | 370 |
| | WB | 24.6 | C | 175 | 49.1 | D | 770 ³ |
| | NB | 28.1 | C | 155 | 81.8 | F | 374 ³ |
| | SB | 34.2 | C | 85 | 65.3 | E | 263 ³ |
| | Overall | 30.0 | C | N/A | 54.6 | D | N/A |

| Intersection ¹ | Approach | A.M. Peak Hour | | | P.M. Peak Hour | | |
|---------------------------------|----------|----------------|----------|-------------------|----------------|----------|-------------------|
| | | Delay (s) | LOS | 95th % Queue (ft) | Delay (s) | LOS | 95th % Queue (ft) |
| 73rd Ave & Bell Rd ² | EB | 13.6 | B | 400 | 20.1 | C | 440 |
| | WB | 9.3 | A | 158 | 19.4 | B | 683 |
| | NB | 7.8 | A | 34 | 11.6 | B | 39 |
| | SB | 31.8 | C | 101 | 65.9 | E | 274 ³ |
| | Overall | 12.6 | B | N/A | 21.4 | C | N/A |
| 69th Ave & Bell Rd ² | EB | 11.8 | B | 441 | 16.5 | B | 469 |
| | WB | 8.0 | A | 164 | 27.5 | C | 1091 ³ |
| | NB | 9.7 | A | 32 | 11.2 | B | 35 |
| | SB | 40.1 | D | 116 | 58.7 | E | 227 ³ |
| | Overall | 11.4 | B | N/A | 24.1 | C | N/A |
| [7] 67th Ave & Bell Rd | EB | 31.7 | C | 649 ³ | 57.6 | E | 550 |
| | WB | 22.2 | C | 175 | 134.1 | F | 1067 ³ |
| | NB | 51.2 | D | 357 ³ | 119.3 | F | 520 ³ |
| | SB | 51.4 | D | 208 | 102.7 | F | 359 ³ |
| | Overall | 37.5 | D | N/A | 104.6 | F | N/A |
| 63rd Ave & Bell Rd ² | EB | 26.7 | C | 520 ³ | 32.8 | C | 524 |
| | WB | 17.3 | B | 137 ³ | 44.7 | D | 767 ³ |
| | NB | 15.5 | B | 64 | 43.2 | D | 295 ³ |
| | SB | 46.0 | D | 297 ³ | 59.9 | E | 476 ³ |
| | Overall | 25.8 | C | N/A | 42.2 | D | N/A |
| [8] 59th Ave & Bell Rd | EB | 38.0 | D | 596 ³ | 43.6 | D | 358 |
| | WB | 32.5 | C | 193 | 53.6 | D | 571 ³ |
| | NB | 59.9 | E | 357 ³ | 69.8 | E | 504 ³ |
| | SB | 63.1 | E | 440 ³ | 60.2 | E | 362 ³ |
| | Overall | 46.2 | D | N/A | 56.0 | E | N/A |

¹Refer to **Figure 4.4** for the intersection number.

²Intersection counts were estimated using macrosimulation modeling.

³Approximation from Synchro analysis due to upstream metering or volume exceeding capacity

During the a.m. peak, all intersections perform at an acceptable LOS D or better, though the northbound and southbound approaches on 59th Avenue operate at a LOS E. During the p.m. peak, three intersections—83rd Avenue, 67th Avenue, and 59th Avenue—perform at an overall failing LOS, with 67th Avenue and Bell Road failing on all approaches to the intersection.

6.2.3 Network-Wide Existing Capacity Analysis

A network-wide analysis was conducted for the entire Study Area roadway network using microsimulation modeling techniques. The results of this analysis are presented in **Table 15**.

Table 15 – Network-Wide Existing (2018) Capacity Analysis Results

| Capacity Measurement | a.m. Peak | p.m. Peak |
|-----------------------------|------------------|------------------|
| Average Delay/Vehicle (s) | 59.1 | 115.4 |
| Average Number of Stops | 1.2 | 2.8 |
| Average Speed (mph) | 43.3 | 32.3 |

Table 15 shows that the network performs better in the a.m. peak hour, for which average delay per vehicle and average number of stops are approximately half what they are in the p.m. peak hour.

6.3 Future (2040) Conditions Analysis Results

A capacity analysis of future conditions was performed for the Study Area using a combination of modeling techniques, discussed in **Section 6.1**. The results of this analysis are divided into the two distinct corridors comprising the Study Area: SR-101L and Bell Road. Select results are also presented for the network as a whole. For the purpose of this Study, LOS D and above was considered acceptable. Intersections and segments performing at LOS E or LOS F warrant consideration for potential improvement. Synchro reports are included in **Appendix C**.

6.3.1 SR-101L Future Capacity Analysis

A Synchro analysis assessing TI operations along SR-101L was performed for TIs within the Study Area extents for the a.m. and p.m. peak hours for the future year (2040) condition. Two scenarios for SR-101L TIs were assessed in Synchro: a model containing future volumes with existing timings and a model containing future volumes with optimized timings. The overall LOS for each ramp terminal and each scenario is presented in **Table 16**. Intersections and intersection approaches that operate at LOS E are highlighted in orange; those operating at LOS F are highlighted in red.

Table 16 – SR-101L TIs Existing and Future Capacity Analysis Comparison

| Intersection | 2018 Existing Overall LOS Analysis: Existing Timings | | | | 2040 Overall LOS: Existing Timings | | 2040 Overall LOS: Optimized Timings | |
|---|--|------|------|------|------------------------------------|------|-------------------------------------|--|
| | Cycle Length (s) a.m. p.m. | a.m. | p.m. | a.m. | p.m. | a.m. | p.m. | |
| Thunderbird Rd & SR-101L SB Ramp Terminal | 145 145 | C | D | C | E | D | E | |
| Thunderbird Rd & SR-101L NB Ramp Terminal | | D | D | E | D | D | E | |
| Bell Rd & SR-101L | 135 120 | D | D | - | - | D | D | |
| Union Hills Dr & SR-101L SB Ramp Terminal | 130 130 | D | F | D | F | C | E | |
| Union Hills Dr & SR-101L NB Ramp Terminal | | C | D | D | E | C | E | |
| 75th Ave & SR-101L EB Ramp Terminal | 180 135 | F | D | F | D | C | D | |
| 75th Ave & SR-101L WB Ramp Terminal | | E | D | F | E | C | E | |
| 67th Ave & SR-101L EB Ramp Terminal | 120 120 | D | E | F | F | E | E | |
| 67th Ave & SR-101L WB Ramp Terminal | | D | F | E | F | D | F | |
| <i>Note: Results use Synchro's built-in methodology to determine LOS.</i> | | | | | | | | |

Regardless of signal timing, all TIs except the Bell Road TI operate at LOS E or LOS F in 2040. However, several TIs perform better under the future optimized timing scenario than they perform under existing conditions. Optimized timings are often used for future year traffic analyses because signal timings are typically adjusted every few years to account for growth, nearby traffic improvements, and other factors that can impact travel patterns at intersections. Detailed capacity analysis results for the optimized timing scenario are presented in **Table 17**, including delay, LOS, and 95th percentile queue length.

Table 17 – SR-101L TIs Future (2040) Capacity Analysis with Optimized Timings

| Intersection ¹ | Approach | A.M. Peak Hour | | | P.M. Peak Hour | | |
|--------------------------------------|----------|----------------|----------|-------------------|----------------|----------|-------------------|
| | | Delay (s) | LOS | 95th % Queue (ft) | Delay (s) | LOS | 95th % Queue (ft) |
| (1) Thunderbird Road & SB SR-101L | EB | 31.7 | C | 235 | 41.5 | D | 486 ² |
| | WB | 71.8 | E | 449 ² | 98.3 | F | 591 ² |
| | NB | N/A | N/A | N/A | N/A | N/A | N/A |
| | SB | 10.5 | B | 220 | 20.4 | C | 348 |
| | Overall | 44.2 | D | N/A | 63.1 | E | N/A |
| (2) Thunderbird Road & NB SR-101L | EB | 85.4 | F | 371 ² | 111.5 | F | 496 ² |
| | WB | 29.0 | C | 242 | 35.8 | D | 406 |
| | NB | 37.2 | D | 809 ² | 44.4 | D | 748 ² |
| | SB | N/A | N/A | N/A | N/A | N/A | N/A |

| Intersection ¹ | Approach | A.M. Peak Hour | | | P.M. Peak Hour | | |
|---------------------------------------|-------------|----------------|-----|-------------------|----------------|-----|-------------------|
| | | Delay (s) | LOS | 95th % Queue (ft) | Delay (s) | LOS | 95th % Queue (ft) |
| Overall | 48.6 | D | N/A | 63.3 | E | N/A | |
| (3) Bell Road & SR-101L | EB | 41.1 | D | 433 | 58.7 | E | 593 ² |
| | WB | 47.1 | D | 264 | 37.0 | D | 369 ² |
| | NB | 41.9 | D | 334 | 65.4 | E | 329 ² |
| | SB | 33.1 | C | 130 | 47.4 | D | 188 |
| | Overall | 42.1 | D | N/A | 49.0 | D | N/A |
| (4) Union Hills Drive & SB SR-101L | EB | 20.9 | C | 210 | 21.1 | C | 239 |
| | WB | 32.1 | C | 294 | 96.2 | F | 713 ² |
| | NB | N/A | N/A | N/A | N/A | N/A | N/A |
| | SB | 14.7 | B | 161 | 12.9 | C | 147 |
| | Overall | 23.4 | C | N/A | 54.0 | E | N/A |
| (5) Union Hills Drive & NB SR-101L | EB | 20.0 | C | 2769 | 57.9 | E | 438 ² |
| | WB | 27.6 | C | 106 | 24.7 | C | 235 |
| | NB | 28.6 | C | 327 | 89.4 | F | 673 ² |
| | SB | N/A | N/A | N/A | N/A | N/A | N/A |
| | Overall | 24.2 | C | N/A | 54.3 | E | N/A |
| (6) 75th Avenue & WB SR-101L | EB | N/A | N/A | N/A | N/A | N/A | N/A |
| | WB | 31.1 | C | 373 ² | 63.5 | E | 728 ² |
| | NB | 25.6 | C | 162 | 83.2 | F | 672 ² |
| | SB | 14.7 | B | 251 | 19.7 | B | 214 |
| | Overall | 21.4 | C | N/A | 55.4 | E | N/A |
| (7) 75th Avenue & EB SR-101L | EB | 44.9 | D | 210 | 36.6 | D | 315 |
| | WB | N/A | N/A | N/A | N/A | N/A | N/A |
| | NB | 40.1 | D | 364 ² | 24.2 | C | 243 |
| | SB | 27.9 | C | 635 ² | 64.8 | E | 425 ² |
| | Overall | 33.5 | C | N/A | 45.6 | D | N/A |
| (8) 67th Avenue & WB SR-101L | EB | N/A | N/A | N/A | N/A | N/A | N/A |
| | WB | 72.1 | E | 603 ² | 122.2 | F | 846 ² |
| | NB | 53.8 | D | 477 ² | 124.7 | F | 773 ² |
| | SB | 21.4 | C | 323 | 30.5 | C | 309 |
| | Overall | 44.5 | D | N/A | 97.4 | F | N/A |
| (9) 67th Avenue & EB SR-101L | EB | 40.4 | D | 308 ² | 33.0 | C | 400 |
| | WB | N/A | N/A | N/A | N/A | N/A | N/A |
| | NB | 77.3 | E | 702 ² | 30.9 | C | 427 ² |
| | SB | 54.0 | D | 665 ² | 132.7 | F | 654 ² |
| | Overall | 57.5 | E | N/A | 75.1 | E | N/A |

¹Refer to **Figure 4.4** for the intersection number.

²Approximation from Synchro analysis due to upstream metering or volume exceeding capacity

During the p.m. peak hour, all TIs except the Bell Road TI operate below LOS D.

Table 18 presents the results of a 2040 capacity analysis performed for SR-101L segments using HCS analysis. A microsimulation analysis was also performed for SR-

101L segments, however, the results are biased by congestion entering the network. Microsimulation results can be provided upon request.

Table 18 – SR-101L Future (2040) Mainline Segment LOS

| Segment | a.m. Peak | | p.m. Peak | |
|-----------------------------------|------------------|------------------|------------------|------------------|
| | North/East-Bound | South/West-Bound | North/East-Bound | South/West-Bound |
| | LOS | LOS | LOS | LOS |
| Thunderbird Rd to Bell Rd | D | D | C | D |
| Bell Rd to Union Hills Dr | C | D | F | F |
| Union Hills Dr to 75th Ave | C | C | C | C |
| 75th Ave to 67th Ave | D | D | C | F |

Improvements which include additional ramp metering and the one additional general purpose lane in each direction along SR-101L within the Study Area are anticipated to be constructed by 2040. Including those improvements in the 2040 operations analysis, the westbound segment between the 67th Avenue and 75th Avenue TIs and both northbound and southbound segments between the Bell Road and Union Hills Drive TIs are expected to operate at LOS F in the 2040 p.m. peak hour. The remainder of segments operate at LOS C or D.

6.3.2 Bell Road Future Capacity Analysis

A Synchro analysis assessing intersection operations along Bell Road was performed for intersections within the Study Area for the a.m. and p.m. peak hours. The results of this analysis are presented in **Table 19**, with delay and LOS broken out by intersection approach and intersections listed in order from west to east. Intersections and approaches to intersections that operate at LOS E are highlighted in orange; those operating at LOS F are highlighted in red. Intersections with a "2" next to the name were analyzed using model-estimated counts.

Table 19 – Bell Road Intersections Future (2040) Capacity Analysis Results

| Intersection ¹ | Approach | A.M. Peak Hour | | | P.M. Peak Hour | | |
|---------------------------------|----------|----------------|----------|-------------------|----------------|----------|-------------------|
| | | Delay (s) | LOS | 95th % Queue (ft) | Delay (s) | LOS | 95th % Queue (ft) |
| 92nd Ave & Bell Rd ² | EB | 17.9 | B | 388 | 13.0 | B | 295 |
| | WB | 4.4 | A | 99 | 3.8 | A | 100 ³ |
| | NB | N/A | N/A | N/A | N/A | N/A | N/A |
| | SB | 32.3 | C | 269 | 45.6 | D | 328 |
| | Overall | 13.4 | B | N/A | 10.2 | B | N/A |
| [1] 91st Ave & Bell Rd | EB | 40.6 | D | 578 ³ | 33.0 | C | 308 |
| | WB | 35.8 | D | 413 ³ | 72.5 | E | 816 ³ |
| | NB | 27.9 | C | 129 | 58.0 | E | 278 ³ |
| | SB | 40.4 | D | 249 ³ | 58.8 | E | 355 ³ |
| | Overall | 37.7 | D | N/A | 55.7 | E | N/A |
| [2] 87th Ave & Bell Rd | EB | 30.5 | C | 821 | 20.0 | C | 536 |
| | WB | 12.7 | B | 204 | 20.8 | C | 734 |
| | NB | 23.6 | C | 66 | 34.8 | C | 153 |
| | SB | 39.8 | D | 116 | 31.6 | C | 104 |
| | Overall | 23.3 | C | N/A | 21.6 | C | N/A |
| 84th Ave & Bell Rd ² | EB | 61.5 | E | 950 ³ | 70.7 | E | 935 ³ |
| | WB | 30.1 | C | 542 | 40.1 | D | 1016 ³ |
| | NB | 17.0 | B | 45 | 53.1 | D | 357 ³ |
| | SB | 41.5 | D | 87 | 189.5 | F | 376 ³ |
| | Overall | 45.8 | D | N/A | 58.5 | E | N/A |
| [3] 83rd Ave & Bell Rd | EB | 35.5 | D | 543 | 58.5 | E | 458 |
| | WB | 33.8 | C | 188 | 154.8 | F | 801 |
| | NB | 45.9 | D | 155 | 92.8 | F | 388 |
| | SB | 44.7 | D | 193 ³ | 69.9 | E | 532 |
| | Overall | 38.0 | D | N/A | 99.0 | F | N/A |
| [4] 79th Ave & Bell Rd | EB | 22.8 | C | 422 | 44.0 | D | 412 |
| | WB | 10.2 | B | 51 | 55.4 | E | 656 ³ |
| | NB | 28.0 | C | 34 | 29.5 | C | 160 |
| | SB | 23.2 | C | 76 | 31.0 | C | 317 |
| | Overall | 19.4 | B | N/A | 46.4 | D | N/A |
| [5] 77th Ave & Bell Rd | EB | 5.7 | A | 136 | 23.2 | C | 493 |
| | WB | 23.7 | C | 206 | 12.9 | B | 111 ³ |
| | NB | 32.0 | C | 23 | 26.0 | C | 98 |
| | SB | 23.4 | C | 46 | 32.5 | C | 294 ³ |
| | Overall | 12.1 | B | N/A | 19.4 | B | N/A |
| [6] 75th Ave & Bell Rd | EB | 30.6 | C | 450 | 34.2 | C | 291 ³ |
| | WB | 25.9 | C | 243 | 130.5 | F | 1117 ³ |
| | NB | 37.1 | D | 177 | 87.2 | F | 310 ³ |
| | SB | 42.2 | D | 103 | 83.5 | F | 264 ³ |
| | Overall | 31.6 | C | N/A | 88.9 | F | N/A |

| Intersection ¹ | Approach | A.M. Peak Hour | | | P.M. Peak Hour | | |
|---------------------------------|----------|----------------|----------|-------------------|----------------|----------|-------------------|
| | | Delay (s) | LOS | 95th % Queue (ft) | Delay (s) | LOS | 95th % Queue (ft) |
| 73rd Ave & Bell Rd ² | EB | 14.4 | B | 469 | 19.5 | B | 509 |
| | WB | 10.2 | B | 168 | 21.2 | C | 846 |
| | NB | 9.0 | A | 32 | 12.5 | B | 41 |
| | SB | 29.2 | C | 76 | 64.8 | E | 258 ³ |
| | Overall | 13.2 | B | N/A | 21.9 | C | N/A |
| 69th Ave & Bell Rd ² | EB | 14.2 | B | 472 | 19.9 | B | 576 |
| | WB | 9.2 | A | 172 | 47.4 | D | 1247 ³ |
| | NB | 10.8 | B | 36 | 15.4 | B | 48 |
| | SB | 34.4 | C | 108 | 70.0 | E | 283 ³ |
| | Overall | 13.2 | B | N/A | 37.5 | D | N/A |
| [7] 67th Ave & Bell Rd | EB | 59.9 | E | 774 ³ | 82.7 | F | 643 ³ |
| | WB | 29.9 | C | 204 | 228.6 | F | 1173 ³ |
| | NB | 71.8 | E | 578 ³ | 221.7 | F | 817 ³ |
| | SB | 64.0 | E | 354 ³ | 160.5 | F | 557 ³ |
| | Overall | 59.3 | E | N/A | 176.5 | F | N/A |
| 63rd Ave & Bell Rd ² | EB | 31.7 | C | 669 ³ | 34.5 | C | 586 |
| | WB | 20.8 | C | 185 ³ | 50.4 | D | 876 ³ |
| | NB | 16.0 | B | 65 | 44.3 | D | 297 ³ |
| | SB | 54.2 | D | 372 ³ | 63.3 | E | 497 ³ |
| | Overall | 30.6 | C | N/A | 45.8 | D | N/A |
| [8] 59th Ave & Bell Rd | EB | 55.7 | E | 747 ³ | 54.0 | D | 396 ³ |
| | WB | 38.6 | D | 240 | 58.1 | E | 631 ³ |
| | NB | 81.6 | F | 435 ³ | 88.3 | F | 563 ³ |
| | SB | 68.6 | E | 500 ³ | 79.2 | E | 403 ³ |
| | Overall | 59.9 | E | N/A | 67.7 | E | N/A |

¹Refer to **Figure 4.4** for the intersection number.

²Intersection counts were estimated using macrosimulation modeling.

³Approximation from Synchro analysis due to upstream metering or volume exceeding capacity

During the a.m. peak hour, most of the intersections along Bell Road continue to operate at a LOS D or better. During the p.m. peak hour, several intersections operate below acceptable LOS.

6.3.3 Network-Wide Future Capacity Analysis

A network-wide analysis was conducted for the entire Study Area roadway network using microsimulation modeling techniques to model 2040 conditions. The results of this analysis are presented in **Table 20**.

Table 20 – Network-Wide Capacity Analysis Results

| Capacity Measurement | a.m. Peak | p.m. Peak |
|-----------------------------|------------------|------------------|
| Average Delay/Vehicle (s) | 79.9 | 213.5 |
| Average Number of Stops | 2.1 | 11.5 |
| Average Speed (mph) | 41.7 | 24.4 |

Table 20 shows that the 2040 network performs better in the a.m. peak hour than the p.m. peak hour, similar to existing conditions. The 2040 network performs somewhat worse than the existing network in the a.m. peak hour. However, the 2040 p.m. network performs considerably worse than the existing p.m. network.

6.4 Greenway TI Analysis

The traffic impact of a potential new partial SR-101L TI at Greenway Road for northbound traffic was assessed using the travel demand modeling software, TransCAD. Traffic patterns within the vicinity of the potential new TI were examined with and without the new TI. 2040 ADT estimates for the Thunderbird Road TI, potential Greenway Road TI, and Bell Road TI are presented for both scenarios in **Table 21**. With the new TI, traffic on the Thunderbird Road off ramp is expected to increase and traffic on the on ramp is expected to decrease. The same is true for the Bell Road TI. The expected demand shift to the Greenway TI in the future peak hour is approximately 400 vehicles. In general, the potential Greenway TI is not expected to significantly improve operations along Thunderbird Road, Bell Road, or 83rd Avenue. In addition, the new TI introduces a short weaving section along SR-101L, which has the potential to increase congestion along mainline SR-101L. A weaving analysis was not performed for this scenario as part of this study.

Table 21 – Greenway TI Analysis Results

| SR-101L TI Ramp | 2040 ADT Estimates | |
|--------------------------------|----------------------------|-------------------------|
| | Without Greenway TI | With Greenway TI |
| NB Off Ramp to Thunderbird Rd | 14780 | 15021 |
| NB On Ramp from Thunderbird Rd | 10946 | 8500 |
| NB Off Ramp to Greenway Rd | - | 2800 |
| NB On Ramp from Greenway Rd | - | 3800 |
| NB Off Ramp to Bell Rd | 16000 | 16509 |
| NB On Ramp from Bell Rd | 14053 | 13300 |

7.0 Conclusion

The analysis assessed the safety and traffic operations of mainline segments and TIs along SR-101L from Thunderbird Road to 67th Avenue and of intersections along Bell Road from 92nd Avenue to 59th Avenue for existing (2018) and future (2040) years. **Table 22** presents the key findings of this study. Additional findings are discussed in more detail below.

Table 22 – Key Study Findings

| Analysis Area | Safety | Operations |
|--------------------------------|---|--|
| Existing SR-101L TIs | High crash frequency at 67th Avenue and Bell Rd TIs. | Except Bell Rd, all TIs perform below LOS D in 2040, optimized or not. |
| Bell Road Intersections | High number of rear-end crashes at 83rd Avenue. | 91st, 84th, 83rd, 67th, and 59th Avenues all perform below LOS D in 2040. |
| SR-101L Mainline | Crash “hot spot” is located between 67th and 75th Avenue TIs. | Mainline performs at LOS F between Bell Rd and Union Hills Dr and SB/WB between 75th and 67th Avenues. |
| Greenway Road TI | N/A | No significant operational improvement. |

Traffic Forecast

Between 2018 and 2040, traffic demand on SR-101L within the Study Area is expected to grow between 22 and 34 percent. The most growth is expected nearest the Thunderbird Road TI, while the least growth is expected east of the 67th Avenue TI. Improvements which include additional ramp metering and one additional general purpose lane in each direction along SR-101L within the Study Area are anticipated to be constructed by 2040.

SR-101L Mainline and TIs

Incorporating growth and programmed improvements in the 2040 operations analysis, the following operational needs were identified for the SR-101L mainline and TIs:

- The westbound segment between the 67th Avenue and 75th Avenue TIs operates at LOS F in the 2040 p.m. peak hour.
- Both northbound and southbound segments between the Bell Road and Union Hills Drive TIs are expected to operate at LOS F in the 2040 p.m. peak hour.
- All other SR-101L mainline segments operate at LOS C or D in 2040.

- In 2040, all TIs except the Bell Road TI operate at LOS E or LOS F in at least one peak hour (primarily the p.m.), regardless of whether signal timings are optimized or not.

The following safety needs were identified for the SR-101L mainline and TIs:

- The highest crash density on SR-101L occurs between the 75th Avenue and 67th Avenue TIs.
- The highest number of rear end and same-direction sideswipe crashes, typically congestion-related crash types, occur between the 75th Avenue and 67th Avenue TIs.
- The segments of SR-101L between the Thunderbird Road and Bell Road TIs and the Bell Road and Union Hills Drive TIs are also crash “hot spots.”
- The most single vehicle crashes happen between the Thunderbird Road and Bell Road TIs.
- The most total, rear end, left-turn, angle, and same-direction sideswipe crashes happen at the 67th Avenue TI intersection.
- The most single vehicle crashes happen at the Bell Road TI intersection.

Bell Road Intersections

Along Bell Road, the most traffic growth is expected in the vicinity of the Arrowhead Town Center (12 percent). Expected traffic growth is approximately six percent east of Arrowhead Town Center and less west of the Bell Road and SR-101L TI.

The following operational needs were identified for Bell Road intersections:

- In 2040, approximately half of the intersections within the Study Area operate at LOS E or LOS F in at least one peak hour.
- Intersections operating at LOS F include 83rd Avenue, 75th Avenue, and 67th Avenue.
- Intersections operating at LOS E include 91st Avenue, 84th Avenue, and 59th Avenue.

The following safety needs were identified for Bell Road intersections:

- 83rd Avenue has the most crashes overall.
- 83rd Avenue has the most angle, rear end, and same-direction sideswipe crashes—crash types typically associated with congestion.

Potential Greenway Road TI

An analysis for a potential new TI at Greenway Road was also conducted. The analysis found:

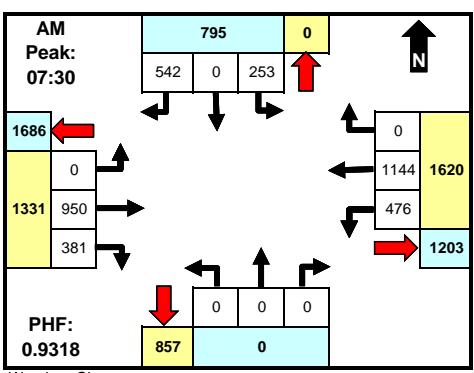
- A new TI at Greenway Road shows no significant improvement in operations along Thunderbird Road, Bell Road, or 83rd Avenue.
- The expected shift in traffic demand in the future peak hour to the potential new TI would be approximately 400 vehicles.
- A new TI at Greenway Road would introduce a short weaving section along SR-101L, which could increase congestion along mainline SR-101L.

APPENDIX A

Turning Movement Counts



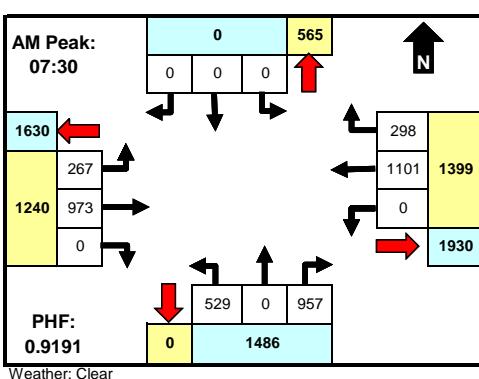
Intersection ID: 1805399
Count Date: 11/13/2018



| Time | SR 101 SB & W THUNDERBIRD RD | | | | | | INTSEC | | | | | | | | | |
|-------|------------------------------|------|------|----------------|------|------|-----------------|----|---|----------------|----|------|----|---|------|-------|
| | From North (SB) | | | From East (WB) | | | From South (NB) | | | From West (EB) | | | | | | |
| | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | TOTAL |
| 0:00 | | | | | | | | | | | | | | | | 0 |
| 0:15 | | | | | | | | | | | | | | | | 0 |
| 0:30 | | | | | | | | | | | | | | | | 0 |
| 0:45 | | | | | | | | | | | | | | | | 0 |
| 1:00 | | | | | | | | | | | | | | | | 0 |
| 1:15 | | | | | | | | | | | | | | | | 0 |
| 1:30 | | | | | | | | | | | | | | | | 0 |
| 1:45 | | | | | | | | | | | | | | | | 0 |
| 2:00 | | | | | | | | | | | | | | | | 0 |
| 2:15 | | | | | | | | | | | | | | | | 0 |
| 2:30 | | | | | | | | | | | | | | | | 0 |
| 2:45 | | | | | | | | | | | | | | | | 0 |
| 3:00 | | | | | | | | | | | | | | | | 0 |
| 3:15 | | | | | | | | | | | | | | | | 0 |
| 3:30 | | | | | | | | | | | | | | | | 0 |
| 3:45 | | | | | | | | | | | | | | | | 0 |
| 4:00 | | | | | | | | | | | | | | | | 0 |
| 4:15 | | | | | | | | | | | | | | | | 0 |
| 4:30 | | | | | | | | | | | | | | | | 0 |
| 4:45 | | | | | | | | | | | | | | | | 0 |
| 5:00 | | | | | | | | | | | | | | | | 0 |
| 5:15 | | | | | | | | | | | | | | | | 0 |
| 5:30 | | | | | | | | | | | | | | | | 0 |
| 5:45 | | | | | | | | | | | | | | | | 0 |
| 6:00 | 26 | 0 | 50 | 0 | | 80 | 86 | 0 | 0 | | 0 | 0 | 0 | 0 | 159 | 487 |
| 6:15 | 37 | 0 | 59 | 0 | | 98 | 113 | 0 | 0 | | 0 | 0 | 0 | 0 | 166 | 560 |
| 6:30 | 50 | 0 | 98 | 0 | | 116 | 171 | 0 | 0 | | 0 | 0 | 0 | 0 | 212 | 735 |
| 6:45 | 68 | 0 | 92 | 0 | | 152 | 207 | 0 | 0 | | 0 | 0 | 0 | 0 | 243 | 870 |
| 7:00 | 51 | 0 | 91 | 0 | | 141 | 194 | 0 | 0 | | 0 | 0 | 0 | 0 | 274 | 849 |
| 7:15 | 44 | 0 | 103 | 0 | | 126 | 234 | 0 | 0 | | 0 | 0 | 0 | 0 | 204 | 813 |
| 7:30 | 65 | 0 | 143 | 0 | | 109 | 289 | 0 | 0 | | 0 | 0 | 0 | 0 | 247 | 948 |
| 7:45 | 80 | 0 | 132 | 0 | | 117 | 349 | 0 | 0 | | 0 | 0 | 0 | 0 | 234 | 1005 |
| 8:00 | 55 | 0 | 146 | 0 | | 132 | 251 | 0 | 0 | | 0 | 0 | 0 | 0 | 233 | 920 |
| 8:15 | 53 | 0 | 121 | 0 | | 118 | 255 | 0 | 0 | | 0 | 0 | 0 | 0 | 236 | 873 |
| 8:30 | 55 | 0 | 100 | 0 | | 116 | 234 | 0 | 0 | | 0 | 0 | 0 | 0 | 255 | 844 |
| 8:45 | 73 | 1 | 126 | 0 | | 97 | 256 | 0 | 0 | | 0 | 0 | 0 | 0 | 256 | 883 |
| 9:00 | | | | | | | | | | | | | | | 0 | 0 |
| 9:15 | | | | | | | | | | | | | | | 0 | 0 |
| 9:30 | | | | | | | | | | | | | | | 0 | 0 |
| 9:45 | | | | | | | | | | | | | | | 0 | 0 |
| 10:00 | | | | | | | | | | | | | | | 0 | 0 |
| 10:15 | | | | | | | | | | | | | | | 0 | 0 |
| 10:30 | | | | | | | | | | | | | | | 0 | 0 |
| 10:45 | | | | | | | | | | | | | | | 0 | 0 |
| 11:00 | | | | | | | | | | | | | | | 0 | 0 |
| 11:15 | | | | | | | | | | | | | | | 0 | 0 |
| 11:30 | | | | | | | | | | | | | | | 0 | 0 |
| 11:45 | | | | | | | | | | | | | | | 0 | 0 |
| 12:00 | | | | | | | | | | | | | | | 0 | 0 |
| 12:15 | | | | | | | | | | | | | | | 0 | 0 |
| 12:30 | | | | | | | | | | | | | | | 0 | 0 |
| 12:45 | | | | | | | | | | | | | | | 0 | 0 |
| 13:00 | | | | | | | | | | | | | | | 0 | 0 |
| 13:15 | | | | | | | | | | | | | | | 0 | 0 |
| 13:30 | | | | | | | | | | | | | | | 0 | 0 |
| 13:45 | | | | | | | | | | | | | | | 0 | 0 |
| 14:00 | | | | | | | | | | | | | | | 0 | 0 |
| 14:15 | | | | | | | | | | | | | | | 0 | 0 |
| 14:30 | | | | | | | | | | | | | | | 0 | 0 |
| 14:45 | | | | | | | | | | | | | | | 0 | 0 |
| 15:00 | 87 | 0 | 114 | 0 | | 190 | 304 | 0 | 0 | | 0 | 0 | 0 | 0 | 318 | 1166 |
| 15:15 | 100 | 0 | 117 | 0 | | 182 | 322 | 0 | 0 | | 0 | 0 | 0 | 0 | 295 | 1135 |
| 15:30 | 81 | 0 | 101 | 0 | | 156 | 363 | 0 | 0 | | 0 | 0 | 0 | 0 | 327 | 1162 |
| 15:45 | 86 | 0 | 127 | 0 | | 190 | 383 | 0 | 1 | | 0 | 0 | 0 | 0 | 296 | 1185 |
| 16:00 | 81 | 0 | 107 | 0 | | 175 | 299 | 0 | 1 | | 0 | 0 | 0 | 0 | 240 | 1031 |
| 16:15 | 81 | 0 | 110 | 0 | | 164 | 353 | 0 | 0 | | 0 | 0 | 0 | 0 | 263 | 1089 |
| 16:30 | 86 | 1 | 108 | 0 | | 209 | 314 | 0 | 0 | | 0 | 0 | 0 | 0 | 294 | 1176 |
| 16:45 | 88 | 0 | 113 | 0 | | 181 | 343 | 0 | 1 | | 0 | 0 | 0 | 0 | 332 | 1194 |
| 17:00 | 81 | 0 | 94 | 0 | | 184 | 354 | 0 | 0 | | 0 | 0 | 0 | 0 | 335 | 1229 |
| 17:15 | 91 | 0 | 110 | 0 | | 188 | 338 | 0 | 0 | | 0 | 0 | 0 | 0 | 311 | 1182 |
| 17:30 | 89 | 0 | 118 | 0 | | 204 | 335 | 0 | 0 | | 0 | 0 | 0 | 0 | 282 | 1131 |
| 17:45 | 68 | 0 | 119 | 0 | | 185 | 337 | 0 | 0 | | 0 | 0 | 0 | 0 | 237 | 1030 |
| 18:00 | | | | | | | | | | | | | | | 0 | 0 |
| 18:15 | | | | | | | | | | | | | | | 0 | 0 |
| 18:30 | | | | | | | | | | | | | | | 0 | 0 |
| 18:45 | | | | | | | | | | | | | | | 0 | 0 |
| 19:00 | | | | | | | | | | | | | | | 0 | 0 |
| 19:15 | | | | | | | | | | | | | | | 0 | 0 |
| 19:30 | | | | | | | | | | | | | | | 0 | 0 |
| 19:45 | | | | | | | | | | | | | | | 0 | 0 |
| 20:00 | | | | | | | | | | | | | | | 0 | 0 |
| 20:15 | | | | | | | | | | | | | | | 0 | 0 |
| 20:30 | | | | | | | | | | | | | | | 0 | 0 |
| 20:45 | | | | | | | | | | | | | | | 0 | 0 |
| 21:00 | | | | | | | | | | | | | | | 0 | 0 |
| 21:15 | | | | | | | | | | | | | | | 0 | 0 |
| 21:30 | | | | | | | | | | | | | | | 0 | 0 |
| 21:45 | | | | | | | | | | | | | | | 0 | 0 |
| 22:00 | | | | | | | | | | | | | | | 0 | 0 |
| 22:15 | | | | | | | | | | | | | | | 0 | 0 |
| 22:30 | | | | | | | | | | | | | | | 0 | 0 |
| 22:45 | | | | | | | | | | | | | | | 0 | 0 |
| 23:00 | | | | | | | | | | | | | | | 0 | 0 |
| 23:15 | | | | | | | | | | | | | | | 0 | 0 |
| 23:30 | | | | | | | | | | | | | | | 0 | 0 |
| 23:45 | | | | | | | | | | | | | | | 0 | 0 |
| Total | 1676 | 2 | 2599 | 0 | 0 | 3610 | 6684 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 6249 | 23497 |



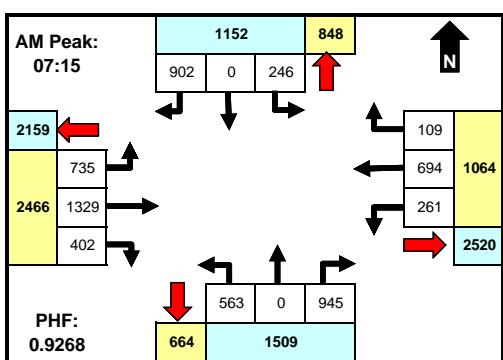
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Count Date: 11/13/2018



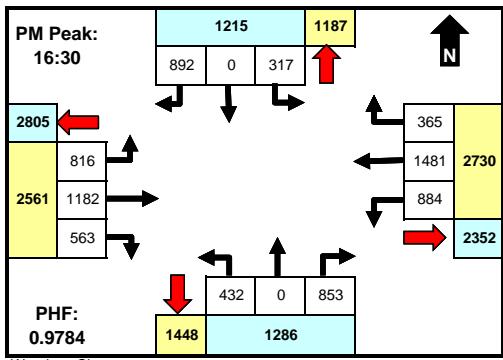
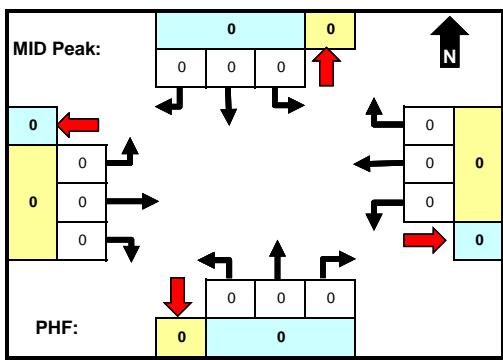
| Time | From North (SB) | | | From East (WB) | | | From South (NB) | | | From West (EB) | | | INTSEC | | | | |
|-------|-----------------|------|----|----------------|------|----|-----------------|------|------|----------------|----|------|--------|------|------|-------|-------|
| | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | TOTAL | |
| 0:00 | | | | | | | | | | | | | | | | 0 | |
| 0:15 | | | | | | | | | | | | | | | | 0 | |
| 0:30 | | | | | | | | | | | | | | | | 0 | |
| 0:45 | | | | | | | | | | | | | | | | 0 | |
| 1:00 | | | | | | | | | | | | | | | | 0 | |
| 1:15 | | | | | | | | | | | | | | | | 0 | |
| 1:30 | | | | | | | | | | | | | | | | 0 | |
| 1:45 | | | | | | | | | | | | | | | | 0 | |
| 2:00 | | | | | | | | | | | | | | | | 0 | |
| 2:15 | | | | | | | | | | | | | | | | 0 | |
| 2:30 | | | | | | | | | | | | | | | | 0 | |
| 2:45 | | | | | | | | | | | | | | | | 0 | |
| 3:00 | | | | | | | | | | | | | | | | 0 | |
| 3:15 | | | | | | | | | | | | | | | | 0 | |
| 3:30 | | | | | | | | | | | | | | | | 0 | |
| 3:45 | | | | | | | | | | | | | | | | 0 | |
| 4:00 | | | | | | | | | | | | | | | | 0 | |
| 4:15 | | | | | | | | | | | | | | | | 0 | |
| 4:30 | | | | | | | | | | | | | | | | 0 | |
| 4:45 | | | | | | | | | | | | | | | | 0 | |
| 5:00 | | | | | | | | | | | | | | | | 0 | |
| 5:15 | | | | | | | | | | | | | | | | 0 | |
| 5:30 | | | | | | | | | | | | | | | | 0 | |
| 5:45 | | | | | | | | | | | | | | | | 0 | |
| 6:00 | 0 | 0 | 0 | 0 | 0 | 0 | 130 | 38 | 0 | 43 | 0 | 89 | 0 | 61 | 127 | 0 | 0 |
| 6:15 | 0 | 0 | 0 | 0 | 0 | 0 | 170 | 40 | 0 | 47 | 0 | 168 | 0 | 44 | 159 | 0 | 0 |
| 6:30 | 0 | 0 | 0 | 0 | 0 | 0 | 202 | 63 | 0 | 82 | 1 | 200 | 0 | 72 | 200 | 0 | 0 |
| 6:45 | 0 | 0 | 0 | 0 | 0 | 0 | 250 | 64 | 0 | 105 | 0 | 247 | 0 | 82 | 246 | 0 | 0 |
| 7:00 | 0 | 0 | 0 | 0 | 0 | 0 | 264 | 59 | 0 | 77 | 1 | 218 | 0 | 77 | 245 | 0 | 0 |
| 7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 258 | 60 | 0 | 99 | 0 | 216 | 0 | 77 | 182 | 0 | 0 |
| 7:30 | 0 | 0 | 0 | 0 | 0 | 0 | 307 | 77 | 0 | 136 | 0 | 246 | 0 | 47 | 251 | 0 | 0 |
| 7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 291 | 69 | 0 | 171 | 0 | 259 | 0 | 70 | 262 | 0 | 0 |
| 8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 245 | 69 | 0 | 122 | 0 | 219 | 0 | 79 | 226 | 0 | 0 |
| 8:15 | 0 | 0 | 0 | 0 | 0 | 0 | 258 | 83 | 0 | 100 | 0 | 233 | 0 | 71 | 234 | 0 | 0 |
| 8:30 | 0 | 0 | 0 | 0 | 0 | 0 | 253 | 63 | 0 | 89 | 1 | 202 | 0 | 89 | 245 | 0 | 1 |
| 8:45 | 0 | 0 | 0 | 0 | 0 | 0 | 265 | 67 | 0 | 96 | 1 | 184 | 0 | 58 | 279 | 0 | 0 |
| 9:00 | | | | | | | | | | | | | | | | 0 | |
| 9:15 | | | | | | | | | | | | | | | | 0 | |
| 9:30 | | | | | | | | | | | | | | | | 0 | |
| 9:45 | | | | | | | | | | | | | | | | 0 | |
| 10:00 | | | | | | | | | | | | | | | | 0 | |
| 10:15 | | | | | | | | | | | | | | | | 0 | |
| 10:30 | | | | | | | | | | | | | | | | 0 | |
| 10:45 | | | | | | | | | | | | | | | | 0 | |
| 11:00 | | | | | | | | | | | | | | | | 0 | |
| 11:15 | | | | | | | | | | | | | | | | 0 | |
| 11:30 | | | | | | | | | | | | | | | | 0 | |
| 11:45 | | | | | | | | | | | | | | | | 0 | |
| 12:00 | | | | | | | | | | | | | | | | 0 | |
| 12:15 | | | | | | | | | | | | | | | | 0 | |
| 12:30 | | | | | | | | | | | | | | | | 0 | |
| 12:45 | | | | | | | | | | | | | | | | 0 | |
| 13:00 | | | | | | | | | | | | | | | | 0 | |
| 13:15 | | | | | | | | | | | | | | | | 0 | |
| 13:30 | | | | | | | | | | | | | | | | 0 | |
| 13:45 | | | | | | | | | | | | | | | | 0 | |
| 14:00 | | | | | | | | | | | | | | | | 0 | |
| 14:15 | | | | | | | | | | | | | | | | 0 | |
| 14:30 | | | | | | | | | | | | | | | | 0 | |
| 14:45 | | | | | | | | | | | | | | | | 0 | |
| 15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 361 | 66 | 0 | 76 | 0 | 154 | 0 | 105 | 325 | 0 | 1 |
| 15:15 | 0 | 0 | 0 | 0 | 0 | 0 | 422 | 103 | 0 | 87 | 0 | 170 | 0 | 88 | 309 | 0 | 0 |
| 15:30 | 0 | 0 | 0 | 0 | 0 | 0 | 416 | 77 | 0 | 116 | 1 | 153 | 0 | 116 | 269 | 0 | 1 |
| 15:45 | 0 | 0 | 0 | 0 | 0 | 0 | 479 | 55 | 0 | 95 | 0 | 163 | 0 | 108 | 308 | 0 | 0 |
| 16:00 | 0 | 0 | 0 | 0 | 0 | 0 | 379 | 83 | 0 | 87 | 0 | 171 | 0 | 127 | 233 | 0 | 0 |
| 16:15 | 0 | 0 | 0 | 0 | 0 | 0 | 391 | 81 | 0 | 124 | 0 | 183 | 0 | 111 | 261 | 0 | 0 |
| 16:30 | 0 | 0 | 0 | 0 | 0 | 0 | 399 | 87 | 0 | 111 | 0 | 185 | 0 | 121 | 262 | 0 | 1 |
| 16:45 | 0 | 0 | 0 | 0 | 0 | 0 | 430 | 64 | 0 | 130 | 1 | 185 | 0 | 116 | 279 | 0 | 1 |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 434 | 78 | 0 | 102 | 1 | 175 | 0 | 129 | 326 | 0 | 0 |
| 17:15 | 0 | 0 | 0 | 0 | 0 | 0 | 431 | 75 | 0 | 112 | 1 | 210 | 0 | 117 | 282 | 0 | 0 |
| 17:30 | 0 | 0 | 0 | 0 | 0 | 0 | 444 | 81 | 0 | 98 | 0 | 189 | 0 | 113 | 257 | 0 | 0 |
| 17:45 | 0 | 0 | 0 | 0 | 0 | 0 | 358 | 76 | 0 | 118 | 0 | 164 | 0 | 115 | 222 | 0 | 0 |
| 18:00 | | | | | | | | | | | | | | | | 0 | |
| 18:15 | | | | | | | | | | | | | | | | 0 | |
| 18:30 | | | | | | | | | | | | | | | | 0 | |
| 18:45 | | | | | | | | | | | | | | | | 0 | |
| 19:00 | | | | | | | | | | | | | | | | 0 | |
| 19:15 | | | | | | | | | | | | | | | | 0 | |
| 19:30 | | | | | | | | | | | | | | | | 0 | |
| 19:45 | | | | | | | | | | | | | | | | 0 | |
| 20:00 | | | | | | | | | | | | | | | | 0 | |
| 20:15 | | | | | | | | | | | | | | | | 0 | |
| 20:30 | | | | | | | | | | | | | | | | 0 | |
| 20:45 | | | | | | | | | | | | | | | | 0 | |
| 21:00 | | | | | | | | | | | | | | | | 0 | |
| 21:15 | | | | | | | | | | | | | | | | 0 | |
| 21:30 | | | | | | | | | | | | | | | | 0 | |
| 21:45 | | | | | | | | | | | | | | | | 0 | |
| 22:00 | | | | | | | | | | | | | | | | 0 | |
| 22:15 | | | | | | | | | | | | | | | | 0 | |
| 22:30 | | | | | | | | | | | | | | | | 0 | |
| 22:45 | | | | | | | | | | | | | | | | 0 | |
| 23:00 | | | | | | | | | | | | | | | | 0 | |
| 23:15 | | | | | | | | | | | | | | | | 0 | |
| 23:30 | | | | | | | | | | | | | | | | 0 | |
| 23:45 | | | | | | | | | | | | | | | | 0 | |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7837 | 1678 | 0 | 0 | 2423 | 7 | 4583 | 0 | 0 | 24715 |



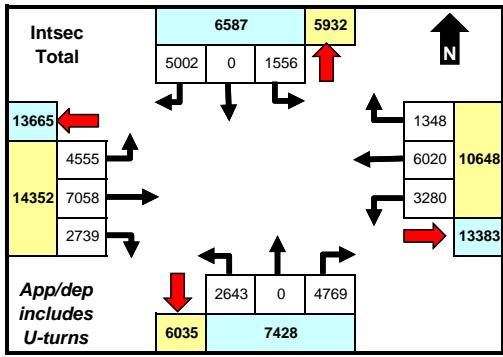
Intersection ID: 1805396
Count Date: 11/13/2018



Weather: Clear



Weather: Clear



| | North | East | South | West | Total | | | | |
|-------|-------|------|-------|-------|-------|------|-------|-------|-------|
| | App | Dep | App | Dep | App | Dep | Total | | |
| AM | 1152 | 848 | 1064 | 2520 | 1509 | 664 | 2466 | 2159 | 6191 |
| MID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PM | 1215 | 1187 | 2730 | 2352 | 1286 | 1448 | 2561 | 2805 | 7792 |
| Total | 6587 | 5932 | 10648 | 13383 | 7428 | 6035 | 14352 | 13665 | 39015 |

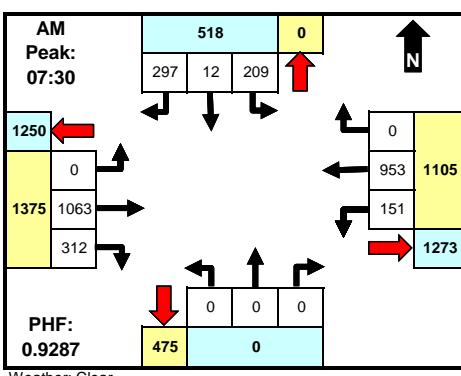
Comments

Unless shown otherwise, MID period defined as 10:00 AM - 2:00 PM.
Peaks defined based on total intersection volume for all vehicle types. Chart totals do not include crosswalk data.

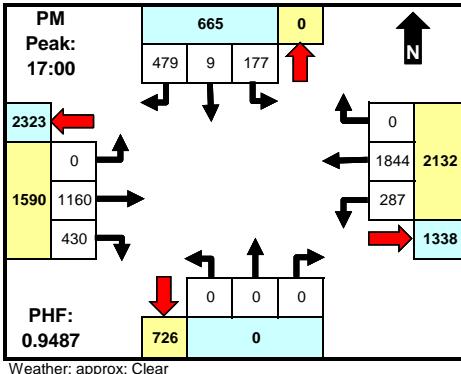
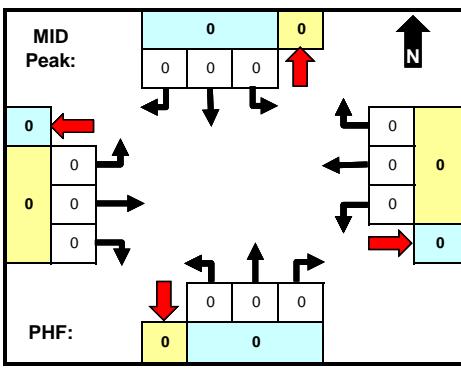
| Time | From North (SB) | | | | From East (WB) | | | | From South (NB) | | | | From West (EB) | | | | INTSEC |
|-------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|--------|
| | SR 101 AGUA FRIA | W BELL RD | SR 101 AGUA FRIA | W BELL RD | SR 101 AGUA FRIA | W BELL RD | SR 101 AGUA FRIA | W BELL RD | SR 101 AGUA FRIA | W BELL RD | SR 101 AGUA FRIA | W BELL RD | SR 101 AGUA FRIA | W BELL RD | SR 101 AGUA FRIA | W BELL RD | |
| 0:00 | | | | | | | | | | | | | | | | | 0 |
| 0:15 | | | | | | | | | | | | | | | | | 0 |
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| 1:30 | | | | | | | | | | | | | | | | | 0 |
| 1:45 | | | | | | | | | | | | | | | | | 0 |
| 2:00 | | | | | | | | | | | | | | | | | 0 |
| 2:15 | | | | | | | | | | | | | | | | | 0 |
| 2:30 | | | | | | | | | | | | | | | | | 0 |
| 2:45 | | | | | | | | | | | | | | | | | 0 |
| 3:00 | | | | | | | | | | | | | | | | | 0 |
| 3:15 | | | | | | | | | | | | | | | | | 0 |
| 3:30 | | | | | | | | | | | | | | | | | 0 |
| 3:45 | | | | | | | | | | | | | | | | | 0 |
| 4:00 | | | | | | | | | | | | | | | | | 0 |
| 4:15 | | | | | | | | | | | | | | | | | 0 |
| 4:30 | | | | | | | | | | | | | | | | | 0 |
| 4:45 | | | | | | | | | | | | | | | | | 0 |
| 5:00 | | | | | | | | | | | | | | | | | 0 |
| 5:15 | | | | | | | | | | | | | | | | | 0 |
| 5:30 | | | | | | | | | | | | | | | | | 0 |
| 5:45 | | | | | | | | | | | | | | | | | 0 |
| 6:00 | 11 | 0 | 85 | 0 | 36 | 58 | 17 | 0 | 47 | 0 | 78 | 0 | 231 | 166 | 61 | 0 | 790 |
| 6:15 | 16 | 0 | 120 | 0 | 52 | 74 | 16 | 0 | 62 | 0 | 116 | 0 | 226 | 219 | 75 | 0 | 976 |
| 6:30 | 19 | 0 | 172 | 3 | 48 | 92 | 16 | 0 | 79 | 0 | 138 | 0 | 166 | 296 | 82 | 0 | 1111 |
| 6:45 | 46 | 0 | 207 | 0 | 64 | 141 | 18 | 0 | 137 | 0 | 194 | 0 | 194 | 328 | 98 | 0 | 1427 |
| 7:00 | 31 | 0 | 182 | 0 | 65 | 118 | 26 | 0 | 109 | 0 | 221 | 0 | 192 | 377 | 97 | 0 | 1418 |
| 7:15 | 43 | 0 | 223 | 0 | 70 | 149 | 26 | 0 | 117 | 0 | 217 | 0 | 177 | 386 | 85 | 0 | 1493 |
| 7:30 | 56 | 0 | 234 | 2 | 67 | 164 | 25 | 0 | 138 | 0 | 218 | 0 | 185 | 311 | 92 | 0 | 1492 |
| 7:45 | 76 | 0 | 255 | 2 | 56 | 195 | 19 | 0 | 156 | 0 | 285 | 1 | 187 | 332 | 106 | 0 | 1670 |
| 8:00 | 71 | 0 | 190 | 0 | 68 | 186 | 39 | 0 | 152 | 0 | 225 | 0 | 186 | 300 | 119 | 0 | 1536 |
| 8:15 | 74 | 0 | 220 | 2 | 71 | 169 | 20 | 0 | 114 | 0 | 212 | 2 | 170 | 300 | 87 | 0 | 1441 |
| 8:30 | 73 | 0 | 222 | 2 | 79 | 168 | 48 | 0 | 108 | 0 | 174 | 1 | 196 | 253 | 95 | 0 | 1419 |
| 8:45 | 61 | 0 | 218 | 0 | 61 | 170 | 28 | 0 | 123 | 0 | 209 | 3 | 174 | 261 | 86 | 0 | 1394 |
| 9:00 | | | | | | | | | | | | | | | | 0 | |
| 9:15 | | | | | | | | | | | | | | | | 0 | |
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| 11:30 | | | | | | | | | | | | | | | | 0 | |
| 11:45 | | | | | | | | | | | | | | | | 0 | |
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| 14:15 | | | | | | | | | | | | | | | | 0 | |
| 14:30 | | | | | | | | | | | | | | | | 0 | |
| 14:45 | | | | | | | | | | | | | | | | 0 | |
| 15:00 | 92 | 0 | 219 | 0 | 203 | 352 | 93 | 0 | 113 | 0 | 188 | 1 | 143 | 278 | 163 | 0 | 1845 |
| 15:15 | 87 | 0 | 268 | 2 | 173 | 384 | 95 | 0 | 94 | 0 | 184 | 0 | 197 | 311 | 131 | 0 | 1926 |
| 15:30 | 105 | 0 | 221 | 1 | 178 | 339 | 94 | 0 | 120 | 0 | 210 | 2 | 168 | 290 | 126 | 0 | 1854 |
| 15:45 | 100 | 0 | 199 | 1 | 230 | 382 | 82 | 0 | 139 | 0 | 229 | 1 | 175 | 310 | 130 | 0 | 1978 |
| 16:00 | 71 | 0 | 214 | 3 | 211 | 373 | 78 | 0 | 108 | 0 | 210 | 1 | 194 | 295 | 150 | 0 | 1908 |
| 16:15 | 55 | 0 | 252 | 4 | 216 | 330 | 81 | 0 | 102 | 0 | 213 | 1 | 193 | 296 | 154 | 0 | 1897 |
| 16:30 | 71 | 0 | 236 | 0 | 220 | 365 | 85 | 0 | 86 | 0 | 225 | 1 | 223 | 280 | 114 | 0 | 1906 |
| 16:45 | 97 | 0 | 231 | 5 | 211 | 315 | 107 | 0 | 110 | 0 | 238 | 0 | 181 | 316 | 140 | 0 | 1951 |
| 17:00 | 80 | 0 | 205 | 0 | 231 | 378 | 86 | 0 | 127 | 0 | 191 | 0 | | | | | |



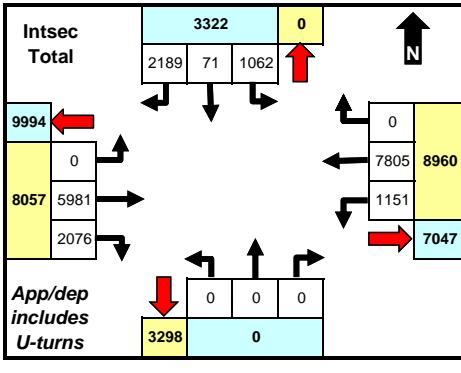
Intersection ID: 1805401
Count Date: 11/13/2018



Weather: Clear



Weather: approx. Clear



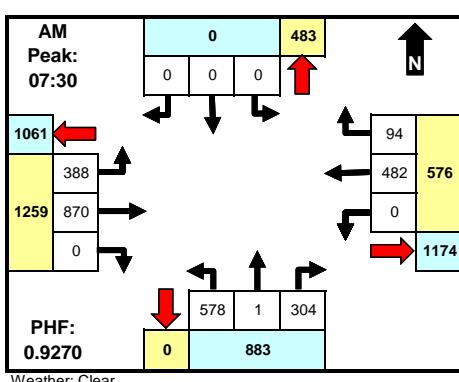
| | North | | East | | South | | West | | Total | |
|-------|-------|-----|------|------|-------|-----|------|------|-------|-------|
| | App | Dep | App | Dep | App | Dep | App | Dep | | |
| AM | 518 | 0 | 1105 | 1273 | 0 | 0 | 475 | 1375 | 1250 | 2998 |
| MID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PM | 665 | 0 | 2132 | 1338 | 0 | 0 | 726 | 1590 | 2323 | 4387 |
| Total | 3322 | 0 | 8960 | 7047 | 0 | 0 | 3298 | 8057 | 9994 | 20339 |

Comments

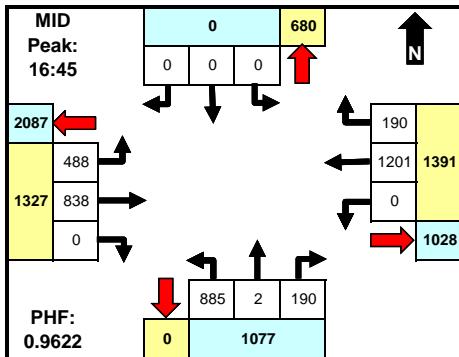
Unless shown otherwise, MID period defined as 10:00 AM - 2:00 PM. Peaks defined based on total intersection volume for all vehicle types. Chart totals do not include crosswalk data.

| SR 101 SB & W UNION HILLS DR | | | | | | | | | | | | | | | | | |
|------------------------------|----|------|-----|------------------|-----|----|------|-----------------|---|-----|----|------------------|----|---|-----|--------|---|
| From North (SB) | | | | From East (WB) | | | | From South (NB) | | | | From West (EB) | | | | INTSEC | |
| SR 101 SB | | | | W UNION HILLS DR | | | | NONE | | | | W UNION HILLS DR | | | | | |
| Time | LT | Thru | RT | U | Cwk | LT | Thru | RT | U | Cwk | LT | Thru | RT | U | Cwk | TOTAL | |
| 0:00 | | | | | | | | | | | | | | | | 0 | |
| 0:15 | | | | | | | | | | | | | | | | 0 | |
| 0:30 | | | | | | | | | | | | | | | | 0 | |
| 0:45 | | | | | | | | | | | | | | | | 0 | |
| 1:00 | | | | | | | | | | | | | | | | 0 | |
| 1:15 | | | | | | | | | | | | | | | | 0 | |
| 1:30 | | | | | | | | | | | | | | | | 0 | |
| 1:45 | | | | | | | | | | | | | | | | 0 | |
| 2:00 | | | | | | | | | | | | | | | | 0 | |
| 2:15 | | | | | | | | | | | | | | | | 0 | |
| 2:30 | | | | | | | | | | | | | | | | 0 | |
| 2:45 | | | | | | | | | | | | | | | | 0 | |
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| 3:45 | | | | | | | | | | | | | | | | 0 | |
| 4:00 | | | | | | | | | | | | | | | | 0 | |
| 4:15 | | | | | | | | | | | | | | | | 0 | |
| 4:30 | | | | | | | | | | | | | | | | 0 | |
| 4:45 | | | | | | | | | | | | | | | | 0 | |
| 5:00 | | | | | | | | | | | | | | | | 0 | |
| 5:15 | | | | | | | | | | | | | | | | 0 | |
| 5:30 | | | | | | | | | | | | | | | | 0 | |
| 5:45 | | | | | | | | | | | | | | | | 0 | |
| 6:00 | 17 | 0 | 29 | 0 | | 18 | 123 | 0 | 0 | | 0 | 0 | 0 | 0 | 151 | 57 | 0 |
| 6:15 | 24 | 0 | 33 | 0 | | 18 | 149 | 0 | 0 | | 0 | 0 | 0 | 0 | 167 | 57 | 0 |
| 6:30 | 26 | 1 | 41 | 0 | | 31 | 225 | 0 | 0 | | 0 | 0 | 0 | 0 | 225 | 63 | 0 |
| 6:45 | 46 | 1 | 51 | 0 | | 39 | 233 | 0 | 0 | | 0 | 0 | 0 | 0 | 198 | 57 | 0 |
| 7:00 | 37 | 0 | 63 | 0 | | 45 | 219 | 0 | 0 | | 0 | 0 | 0 | 0 | 234 | 66 | 0 |
| 7:15 | 56 | 3 | 62 | 0 | | 46 | 175 | 0 | 0 | | 0 | 0 | 0 | 0 | 213 | 77 | 0 |
| 7:30 | 48 | 3 | 71 | 0 | | 46 | 250 | 0 | 1 | | 0 | 0 | 0 | 0 | 296 | 92 | 0 |
| 7:45 | 58 | 3 | 77 | 0 | | 46 | 244 | 0 | 0 | | 0 | 0 | 0 | 0 | 290 | 89 | 0 |
| 8:00 | 56 | 3 | 91 | 0 | | 46 | 227 | 0 | 0 | | 0 | 0 | 0 | 0 | 255 | 72 | 0 |
| 8:15 | 47 | 3 | 58 | 0 | | 33 | 232 | 0 | 0 | | 0 | 0 | 0 | 0 | 222 | 59 | 0 |
| 8:30 | 48 | 8 | 69 | 0 | | 41 | 259 | 0 | 0 | | 0 | 0 | 0 | 0 | 233 | 68 | 0 |
| 8:45 | 41 | 6 | 97 | 0 | | 31 | 236 | 0 | 1 | | 0 | 0 | 0 | 0 | 242 | 61 | 0 |
| 9:00 | | | | | | | | | | | | | | | | 0 | |
| 9:15 | | | | | | | | | | | | | | | | 0 | |
| 9:30 | | | | | | | | | | | | | | | | 0 | |
| 9:45 | | | | | | | | | | | | | | | | 0 | |
| 10:00 | | | | | | | | | | | | | | | | 0 | |
| 10:15 | | | | | | | | | | | | | | | | 0 | |
| 10:30 | | | | | | | | | | | | | | | | 0 | |
| 10:45 | | | | | | | | | | | | | | | | 0 | |
| 11:00 | | | | | | | | | | | | | | | | 0 | |
| 11:15 | | | | | | | | | | | | | | | | 0 | |
| 11:30 | | | | | | | | | | | | | | | | 0 | |
| 11:45 | | | | | | | | | | | | | | | | 0 | |
| 12:00 | | | | | | | | | | | | | | | | 0 | |
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| 12:30 | | | | | | | | | | | | | | | | 0 | |
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| 13:15 | | | | | | | | | | | | | | | | 0 | |
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| 13:45 | | | | | | | | | | | | | | | | 0 | |
| 14:00 | | | | | | | | | | | | | | | | 0 | |
| 14:15 | | | | | | | | | | | | | | | | 0 | |
| 14:30 | | | | | | | | | | | | | | | | 0 | |
| 14:45 | | | | | | | | | | | | | | | | 0 | |
| 15:00 | 69 | 5 | 134 | 0 | | 44 | 370 | 0 | 0 | | 0 | 0 | 0 | 0 | 276 | 116 | 0 |
| 15:15 | 49 | 6 | 107 | 0 | | 54 | 396 | 0 | 0 | | 0 | 0 | 0 | 0 | 300 | 108 | 0 |
| 15:30 | 58 | 5 | 127 | 0 | | 29 | 409 | 0 | 0 | | 0 | 0 | 0 | 0 | 270 | 110 | 0 |
| 15:45 | 58 | 4 | 140 | 0 | | 68 | 412 | 0 | 0 | | 0 | 0 | 0 | 0 | 233 | 103 | 0 |
| 16:00 | 40 | 2 | 100 | 0 | | 67 | 473 | 0 | 0 | | 0 | 0 | 0 | 0 | 241 | 96 | 0 |
| 16:15 | 33 | 0 | 145 | 0 | | 49 | 442 | 0 | 0 | | 0 | 0 | 0 | 0 | 264 | 99 | 0 |
| 16:30 | 39 | 4 | 127 | 0 | | 74 | 406 | 0 | 1 | | 0 | 0 | 0 | 0 | 249 | 102 | 0 |
| 16:45 | 35 | 5 | 88 | 0 | | 59 | 481 | 0 | 0 | | 0 | 0 | 0 | 0 | 262 | 94 | 0 |
| 17:00 | 45 | 7 | 114 | 0 | | 67 | 467 | 0 | 0 | | 0 | 0 | 0 | 0 | 331 | 125 | 0 |
| 17:15 | 46 | 0 | 118 | 0 | | 93 | 437 | 0 | 0 | | 0 | 0 | 0 | 0 | 268 | 110 | 0 |
| 17:30 | 40 | 1 | 96 | 0 | | 74 | 516 | 0 | 0 | | 0 | 0 | 0 | 0 | 299 | 95 | 0 |
| 17:45 | 46 | 1 | 151 | 0 | | 53 | 424 | | | | | | | | | | |

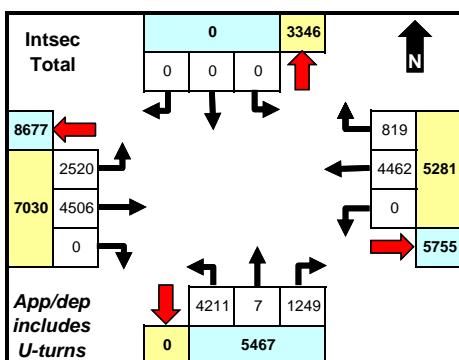
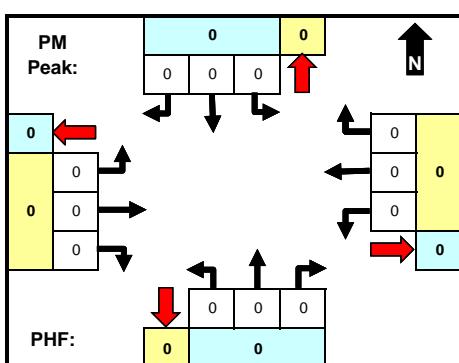
Intersection ID: 1805402
Count Date: 11/13/2018



Weather: Clear



Weather: Clear



| | North | | East | | South | | West | | |
|--------------|-------|------|------|------|-------|-----|------|------|-------|
| | App | Dep | App | Dep | App | Dep | App | Dep | Total |
| AM | 0 | 483 | 576 | 1174 | 883 | 0 | 1259 | 1061 | 2718 |
| MID | 0 | 680 | 1391 | 1028 | 1077 | 0 | 1327 | 2087 | 3795 |
| PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total | 0 | 3246 | 5281 | 5755 | 5467 | 0 | 7030 | 8677 | #### |

Comments

Unless shown otherwise, MID period defined as 10:00 AM - 2:00 PM. Peaks defined based on total intersection volume for all vehicle types. Chart totals do not include crosswalk data.

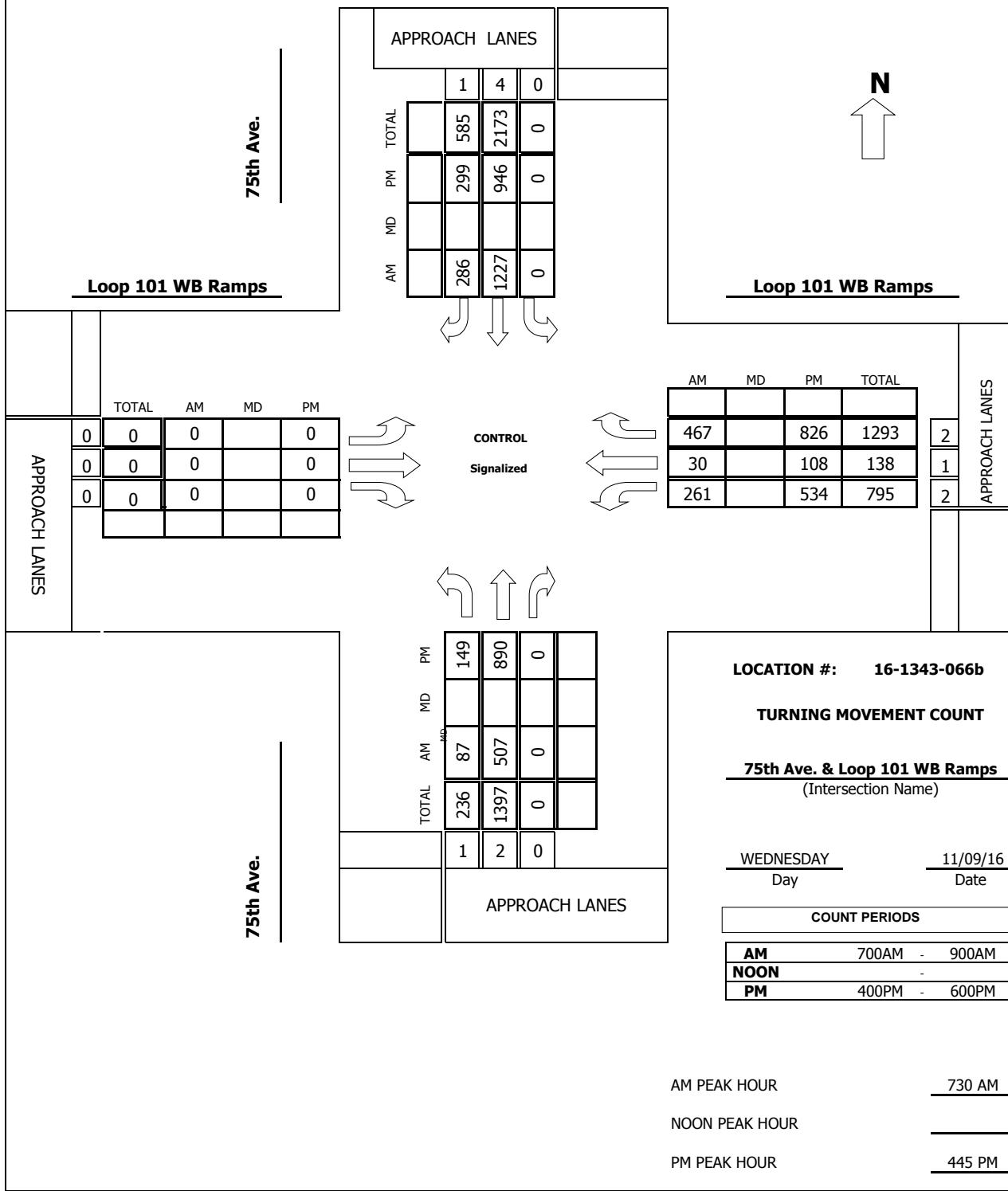
| SR 101 NB & W UNION HILLS DR | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|-----|------|-----|------------------|------|-----|-------|-----------------|-----|-------|-------|------------------|-----|-----|-------|--------|------|-------|-----|------|-------|
| From North (SB) | | | | From East (WB) | | | | From South (NB) | | | | From West (EB) | | | | INTSEC | | | | | |
| NONE | | | | W UNION HILLS DR | | | | SR 101 NB | | | | W UNION HILLS DR | | | | | | | | | |
| Time | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | TOTAL |
| 0:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 0:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 0:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 0:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 1:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 1:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 1:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 1:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 2:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 2:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 2:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 2:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 3:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 3:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 3:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 3:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 4:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 4:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 4:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 4:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 5:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 5:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 5:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 5:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 6:00 | 0 | 0 | 0 | 0 | | 0 | 41 | 36 | 0 | 94 | 1 | 27 | 0 | | 91 | 67 | 0 | 0 | | | 357 |
| 6:15 | 0 | 0 | 0 | 0 | | 0 | 44 | 23 | 0 | 122 | 0 | 42 | 0 | | 79 | 116 | 0 | 0 | | | 426 |
| 6:30 | 0 | 0 | 0 | 0 | | 0 | 107 | 21 | 0 | 152 | 0 | 56 | 0 | | 95 | 154 | 0 | 0 | | | 585 |
| 6:45 | 0 | 0 | 0 | 0 | | 0 | 103 | 24 | 0 | 170 | 0 | 62 | 0 | | 91 | 184 | 0 | 0 | | | 634 |
| 7:00 | 0 | 0 | 0 | 0 | | 0 | 106 | 32 | 0 | 152 | 0 | 44 | 0 | | 82 | 181 | 0 | 0 | | | 597 |
| 7:15 | 0 | 0 | 0 | 0 | | 0 | 96 | 30 | 0 | 127 | 0 | 59 | 0 | | 88 | 184 | 0 | 0 | | | 584 |
| 7:30 | 0 | 0 | 0 | 0 | | 0 | 127 | 25 | 0 | 169 | 0 | 70 | 0 | | 102 | 214 | 0 | 0 | | | 707 |
| 7:45 | 0 | 0 | 0 | 0 | | 0 | 99 | 24 | 0 | 162 | 1 | 89 | 0 | | 116 | 242 | 0 | 0 | | | 733 |
| 8:00 | 0 | 0 | 0 | 0 | | 0 | 116 | 17 | 0 | 133 | 0 | 82 | 0 | | 96 | 216 | 0 | 0 | | | 660 |
| 8:15 | 0 | 0 | 0 | 0 | | 0 | 140 | 28 | 0 | 114 | 0 | 63 | 0 | | 74 | 198 | 0 | 1 | | | 618 |
| 8:30 | 0 | 0 | 0 | 0 | | 0 | 148 | 29 | 0 | 143 | 0 | 56 | 0 | | 95 | 178 | 0 | 0 | | | 649 |
| 8:45 | 0 | 0 | 0 | 0 | | 0 | 140 | 30 | 0 | 124 | 0 | 41 | 0 | | 95 | 182 | 0 | 1 | | | 613 |
| 9:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 9:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 9:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 9:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 10:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 10:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 10:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 10:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 11:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 11:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 11:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 11:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 12:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 12:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 12:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 12:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 13:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 13:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 13:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 13:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 14:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 14:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 14:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 14:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 15:00 | 0 | 0 | 0 | 0 | | 0 | 224 | 34 | 0 | 205 | 1 | 49 | 0 | | 110 | 218 | 0 | 1 | | | 842 |
| 15:15 | 0 | 0 | 0 | 0 | | 0 | 230 | 34 | 0 | 185 | 0 | 61 | 0 | | 144 | 221 | 0 | 0 | | | 875 |
| 15:30 | 0 | 0 | 0 | 0 | | 0 | 239 | 44 | 0 | 198 | 0 | 38 | 0 | | 109 | 202 | 0 | 0 | | | 830 |
| 15:45 | 0 | 0 | 0 | 0 | | 0 | 254 | 44 | 0 | 239 | 0 | 42 | 0 | | 128 | 181 | 0 | 0 | | | 888 |
| 16:00 | 0 | 0 | 0 | 0 | | 0 | 287 | 39 | 0 | 195 | 0 | 47 | 0 | | 119 | 168 | 0 | 0 | | | 855 |
| 16:15 | 0 | 0 | 0 | 0 | | 0 | 258 | 43 | 0 | 215 | 1 | 44 | 0 | | 100 | 186 | 0 | 0 | | | 847 |
| 16:30 | 0 | 0 | 0 | 0 | | 0 | 247 | 31 | 0 | 233 | 0 | 47 | 0 | | 118 | 184 | 0 | 0 | | | 860 |
| 16:45 | 0 | 0 | 0 | 0 | | 0 | 286 | 45 | 0 | 206 | 2 | 52 | 0 | | 110 | 189 | 0 | 0 | | | 890 |
| 17:00 | 0 | 0 | 0 | 0 | | 0 | 311 | 49 | 0 | 225 | 0 | 42 | 0 | | 113 | 246 | 0 | 0 | | | 986 |
| 17:15 | 0 | 0 | 0 | 0 | | 0 | 285 | 47 | 0 | 238 | 0 | 53 | 0 | | 143 | 180 | 0 | 0 | | | 946 |
| 17:30 | 0 | 0 | 0 | 0 | | 0 | 319 | 49 | 0 | 216 | 0 | 43 | 0 | | 122 | 223 | 0 | 1 | | | 973 |
| 17:45 | 0 | 0 | 0 | 0 | | 0 | 255 | 41 | 0 | 194 | 1 | 40 | 0 | | 100 | 192 | 0 | 0 | | | 823 |
| 18:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 18:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 18:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 18:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 19:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 19:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 19:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 19:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 20:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 20:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 20:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 20:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 21:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 21:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 21:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 21:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 22:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 22:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 22:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 22:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 23:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 23:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 23:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 23:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 4462 | 819 | 0 | 4211 | 7 | 1249 | 0 | 0 | 2520 | 4506 | 0 | 4 | 0 | | 1778 |
| M Peak Hr: | | | | | | | | | | | | | | | | | | | | | 7:30 |
| Pk Vol | 0 | 0 | 0 | 0 | 0 | 0 | 482 | 94 | 0 | 578 | 1 | 304 | 0 | 0 | 388 | 870 | 0 | 1 | 0 | | 2718 |
| PHF | n/a | n/a | n/a | n/a | n/a | n/a | 0.861 | 0.839 | n/a | 0.855 | 0.250 | 0.854 | n/a | n/a | 0.836 | 0.899 | n/a | 0.250 | n/a | | 0.927 |
| ID Peak Hr: | | | | | | | | | | | | | | | | | | | | | 16:45 |
| Pk Vol | 0 | 0 | 0 | 0 | 0 | 0 | 1201 | 190 | 0 | | | | | | | | | | | | |

Intersection Turning Movement Prepared by:



Project #: 16-1343-066b

TMC SUMMARY OF 75th Ave. & Loop 101 WB Ramps





FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: 75th Ave.

Date: 11/09/16

E-W STREET: Loop 101 WB Ramps

Day: WEDNESDAY

City: Glendale

Project #: 16-1343-066b

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 1 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 1 | 0 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 0 |

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 0 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 1 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 0 |

West Leg

East Leg

North Leg

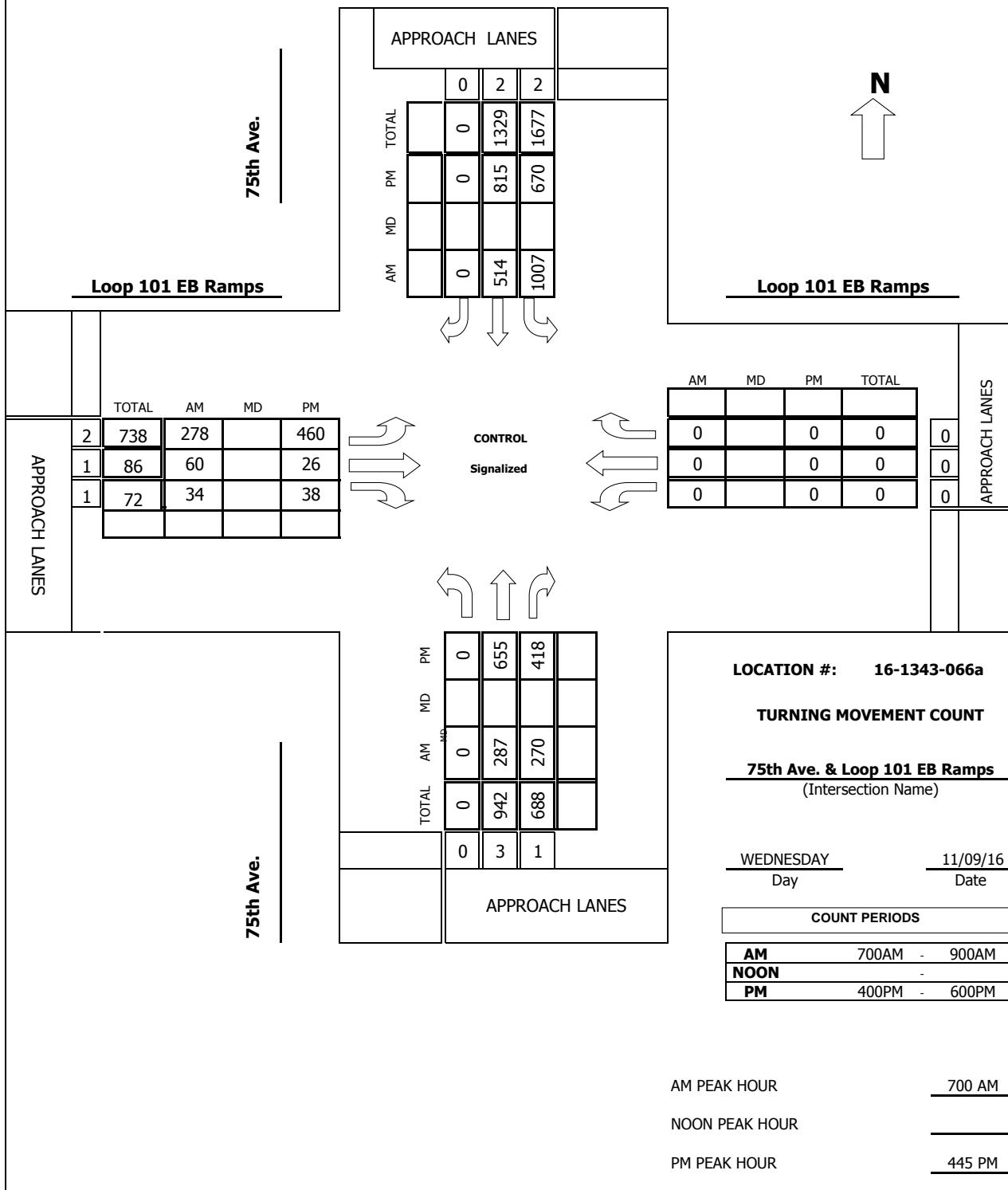
South Leg

**Intersection Turning Movement
Prepared by:**

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 16-1343-066a

TMC SUMMARY OF 75th Ave. & Loop 101 EB Ramps





FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: 75th Ave.

Date: 11/09/16

E-W STREET: Loop 101 EB Ramps

Day: WEDNESDAY

City: Glendale

Project #: 16-1343-066a

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 2 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 2 | 0 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 0 |

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 0 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 1 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 1 | 0 |
| 5:45 PM | 0 | 0 | 1 | 0 |
| TOTAL | 0 | 0 | 3 | 0 |

North Leg

East Leg

West Leg

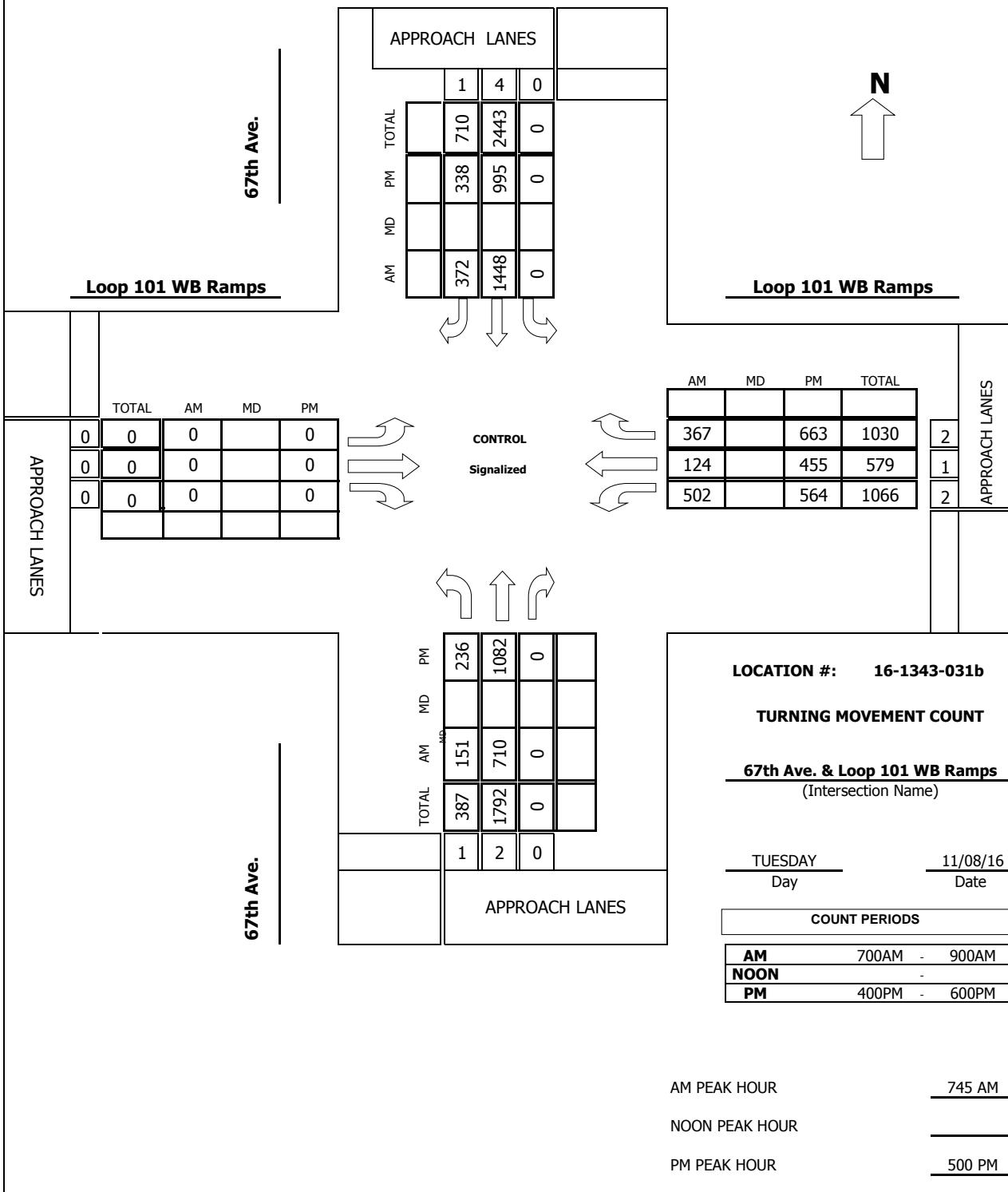
South Leg

**Intersection Turning Movement
Prepared by:**



Project #: 16-1343-031b

TMC SUMMARY OF 67th Ave. & Loop 101 WB Ramps





FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: 67th Ave.

Date: 11/08/16

E-W STREET: Loop 101 WB Ramps

Day: TUESDAY

City: Glendale

Project #: 16-1343-031b

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 2 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 1 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 3 | 0 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 1 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 1 | 0 |

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 0 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 |
| 4:45 PM | 2 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 2 | 0 | 0 | 0 |

North Leg

East Leg

West Leg

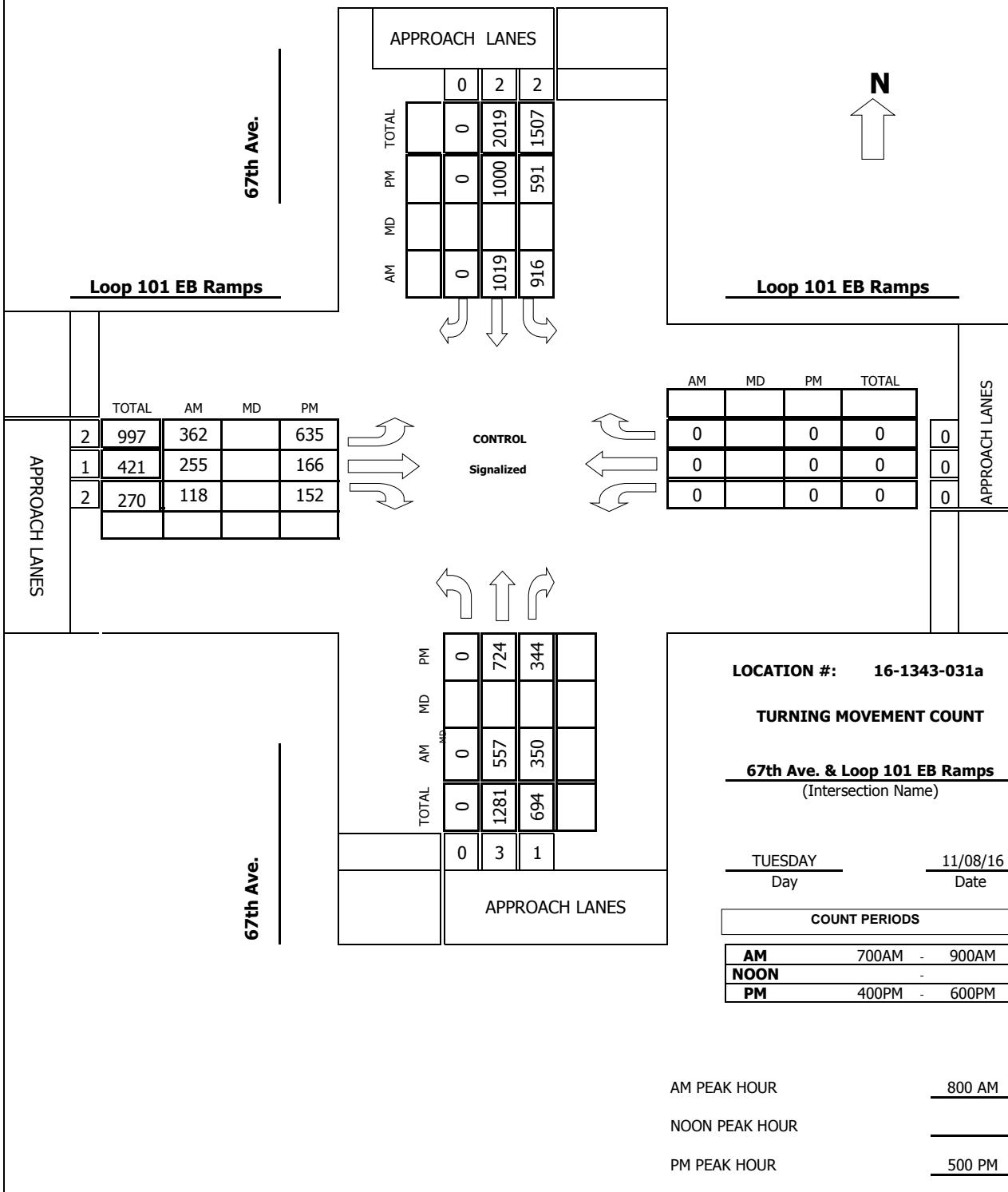
South Leg

**Intersection Turning Movement
Prepared by:**



Project #: 16-1343-031a

TMC SUMMARY OF 67th Ave. & Loop 101 EB Ramps





FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: 67th Ave.

Date: 11/08/16

E-W STREET: Loop 101 EB Ramps

Day: TUESDAY

City: Glendale

Project #: 16-1343-031a

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 1 | 1 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 1 | 0 |
| 8:45 AM | 0 | 0 | 1 | 0 |
| TOTAL | 0 | 1 | 3 | 1 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 1 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 1 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 2 | 2 |

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 0 | 1 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 1 | 0 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 0 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 2 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 2 | 1 |

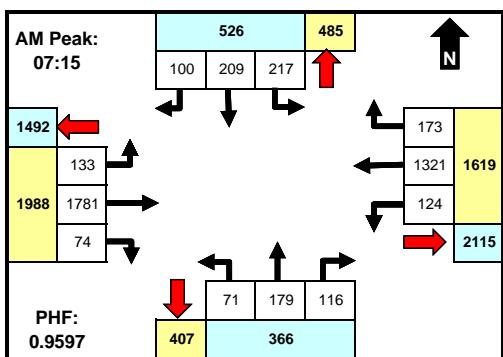
North Leg

West Leg

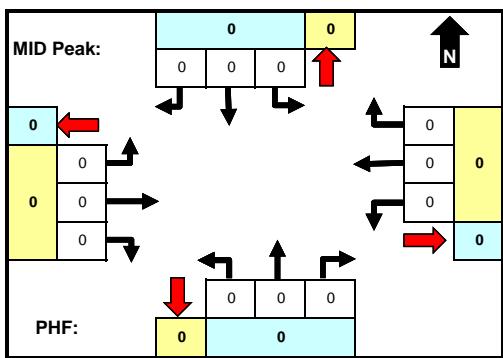
East Leg

South Leg

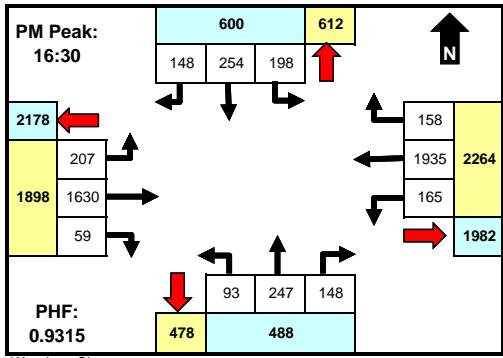
Intersection ID: 1805397
Count Date: 11/13/2018



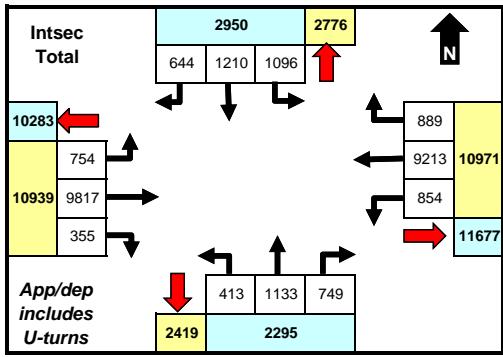
Weather: Clear



1



Weather: Clear

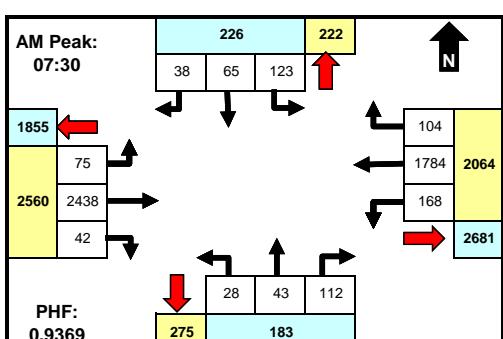


| | North | | East | | South | | West | | |
|-------|-------|------|-------|-------|-------|------|-------|-------|-------|
| | App | Dep | App | Dep | App | Dep | App | Dep | Total |
| AM | 526 | 485 | 1619 | 2115 | 366 | 407 | 1988 | 1492 | 4499 |
| MID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PM | 600 | 612 | 2264 | 1982 | 488 | 478 | 1989 | 2178 | 5250 |
| Total | 2950 | 2776 | 10971 | 11677 | 2295 | 2419 | 10939 | 10283 | 27155 |

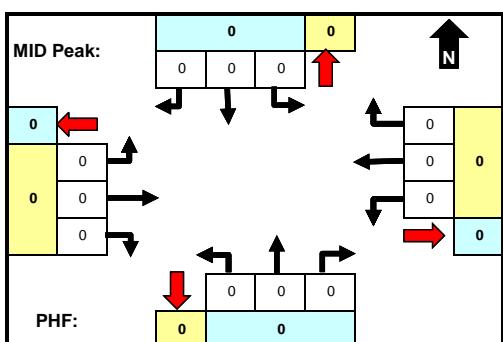
Comments

Unless shown otherwise, MID period defined as 10:00 AM - 2:00 PM.
Peaks defined based on total intersection volume for all vehicle types. Chart totals do not include crosswalk data.

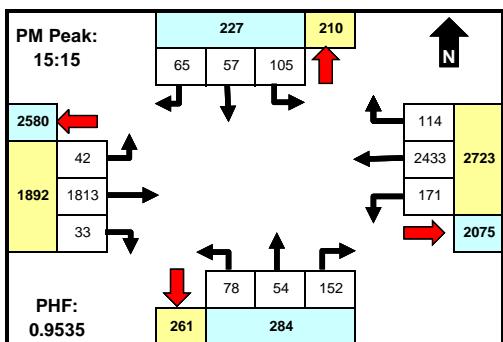
Intersection ID: 1805403
Count Date: 11/13/2018



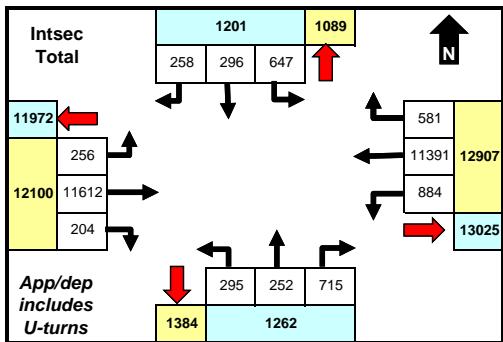
Weather: Clear



100



Weather: Clear

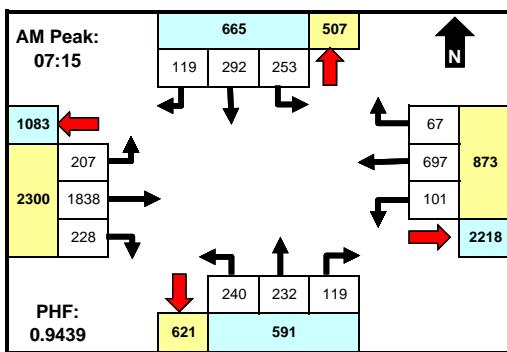


| | North | | East | | South | | West | | Total |
|-------|-------|------|-------|-------|-------|------|-------|-------|-------|
| | App | Dep | App | Dep | App | Dep | App | Dep | |
| AM | 226 | 222 | 2064 | 2681 | 183 | 275 | 2560 | 1855 | 5033 |
| MID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PM | 227 | 210 | 2723 | 2075 | 284 | 261 | 1892 | 2580 | 5126 |
| Total | 1201 | 1089 | 12907 | 13025 | 1262 | 1384 | 12100 | 11972 | 27470 |

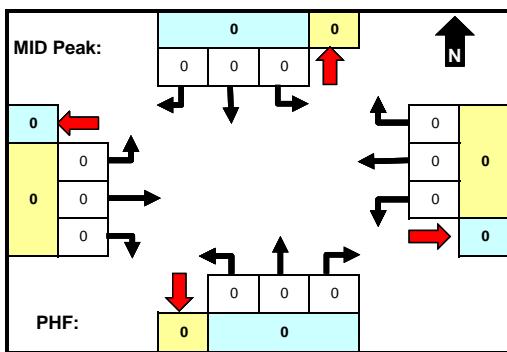
Comments

Unless shown otherwise, MID period defined as 10:00 AM - 2:00 PM.
Peaks defined based on total intersection volume for all vehicle types.
Chart totals do not include crosswalk data.

Intersection ID: 1805398
Count Date: 11/13/2018



Weather: Clear



PM Peak:
16:30

| | | |
|-----|------|------|
| | 1147 | 1293 |
| 389 | 554 | 200 |

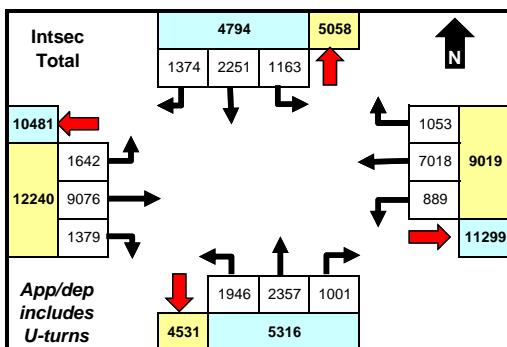
2673 ←
404
2188
1461
299

1820 ←
2356
236
1895

PHF:
0.9636

| | | | |
|------|------|-----|-----|
| 1092 | 440 | 594 | 225 |
| 1262 | 1147 | | |

Weather: Clear



| | North | | East | | South | | West | | Total |
|-------|-------|------|------|-------|-------|------|-------|-------|-------|
| | App | Dep | App | Dep | App | Dep | App | Dep | |
| AM | 665 | 507 | 873 | 2218 | 591 | 621 | 2300 | 1083 | 4429 |
| MID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PM | 1147 | 1293 | 2356 | 1895 | 1262 | 1092 | 2188 | 2673 | 6953 |
| Total | 4794 | 5058 | 9019 | 12199 | 5316 | 4531 | 12240 | 10481 | 31369 |

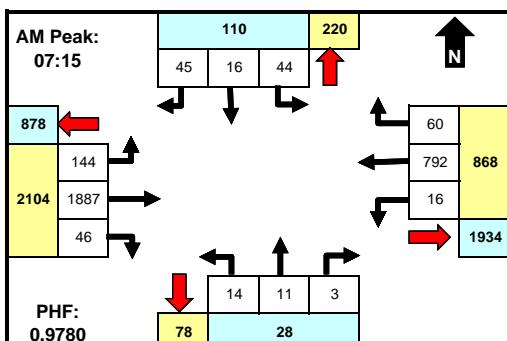
Comments

Unless shown otherwise, MID period defined as 10:00 AM - 2:00 PM.
Peaks defined based on total intersection volume for all vehicle types.
Chart totals do not include crosswalk data.

| N 83RD AVE & W BELL RD | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|------|------|------|-----------------------------|------|------|------|-------------------------------|------|------|------|-----------------------------|------|-----|------|--------|------|------|------|------|-------|
| From North (SB) N 83RD AVE | | | | From East (WB) W BELL RD | | | | From South (NB) N 83RD AVE | | | | From West (EB) W BELL RD | | | | INTSEC | | | | | |
| Time | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | TOTAL |
| 0:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 0:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 0:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 0:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 1:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 1:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 1:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 1:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 2:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 2:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 2:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 2:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 3:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 3:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 3:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 3:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 4:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 4:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 4:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 4:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 5:00 | | | | | | | | | | | | | | | | | | | | | 0 |
| 5:15 | | | | | | | | | | | | | | | | | | | | | 0 |
| 5:30 | | | | | | | | | | | | | | | | | | | | | 0 |
| 5:45 | | | | | | | | | | | | | | | | | | | | | 0 |
| 6:00 | 17 | 20 | 11 | 0 | 3 | 67 | 4 | 0 | | 23 | 18 | 9 | 0 | | 19 | 197 | 11 | 3 | | 402 | |
| 6:15 | 26 | 34 | 10 | 0 | 11 | 103 | 4 | 1 | 30 | 30 | 7 | 0 | | 19 | 300 | 20 | 4 | | 599 | | |
| 6:30 | 37 | 36 | 4 | 0 | 10 | 118 | 17 | 4 | 44 | 49 | 13 | 0 | | 20 | 386 | 24 | 8 | | 770 | | |
| 6:45 | 50 | 76 | 21 | 0 | 13 | 138 | 18 | 3 | 52 | 41 | 21 | 0 | | 30 | 442 | 54 | 6 | | 965 | | |
| 7:00 | 52 | 65 | 22 | 0 | 11 | 138 | 13 | 2 | 50 | 53 | 22 | 0 | | 33 | 515 | 68 | 6 | | 1050 | | |
| 7:15 | 85 | 73 | 33 | 0 | 20 | 146 | 13 | 3 | 59 | 53 | 24 | 0 | | 54 | 500 | 44 | 10 | | 1117 | | |
| 7:30 | 67 | 59 | 28 | 1 | 17 | 168 | 18 | 1 | 57 | 52 | 33 | 0 | | 39 | 452 | 46 | 5 | | 1043 | | |
| 7:45 | 52 | 92 | 31 | 0 | 28 | 176 | 15 | 2 | 62 | 71 | 34 | 0 | | 55 | 473 | 77 | 5 | | 1173 | | |
| 8:00 | 49 | 68 | 27 | 0 | 36 | 207 | 21 | 2 | 62 | 56 | 28 | 0 | | 59 | 413 | 61 | 7 | | 1096 | | |
| 8:15 | 38 | 85 | 27 | 0 | 25 | 156 | 19 | 2 | 62 | 88 | 32 | 0 | | 53 | 447 | 54 | 8 | | 1096 | | |
| 8:30 | 50 | 84 | 39 | 0 | 19 | 188 | 32 | 3 | 54 | 60 | 30 | 0 | | 61 | 324 | 52 | 5 | | 1001 | | |
| 8:45 | 45 | 51 | 30 | 0 | 25 | 153 | 25 | 2 | 59 | 62 | 41 | 0 | | 58 | 347 | 56 | 11 | | 965 | | |
| 9:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 9:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 9:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 9:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 10:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 10:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 10:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 10:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 11:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 11:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 11:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 11:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 12:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 12:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 12:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 12:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 13:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 13:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 13:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 13:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 14:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 14:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 14:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 14:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 15:00 | 56 | 110 | 80 | 0 | 49 | 425 | 65 | 3 | 119 | 124 | 64 | 0 | | 89 | 352 | 61 | 4 | | 1601 | | |
| 15:15 | 48 | 107 | 91 | 0 | 51 | 392 | 78 | 3 | 121 | 139 | 75 | 4 | | 94 | 379 | 62 | 8 | | 1652 | | |
| 15:30 | 49 | 129 | 90 | 0 | 52 | 426 | 75 | 4 | 120 | 151 | 71 | 0 | | 110 | 365 | 63 | 6 | | 1711 | | |
| 15:45 | 46 | 122 | 89 | 0 | 52 | 430 | 73 | 4 | 112 | 154 | 55 | 0 | | 99 | 434 | 60 | 3 | | 1733 | | |
| 16:00 | 46 | 112 | 103 | 0 | 62 | 403 | 74 | 4 | 128 | 173 | 58 | 1 | | 83 | 354 | 59 | 3 | | 1663 | | |
| 16:15 | 50 | 113 | 94 | 1 | 44 | 430 | 60 | 2 | 105 | 130 | 55 | 3 | | 93 | 330 | 57 | 3 | | 1570 | | |
| 16:30 | 40 | 121 | 85 | 0 | 71 | 469 | 70 | 1 | 105 | 142 | 46 | 0 | | 93 | 349 | 61 | 7 | | 1660 | | |
| 16:45 | 49 | 131 | 103 | 3 | 51 | 453 | 80 | 3 | 100 | 141 | 56 | 3 | | 119 | 408 | 79 | 6 | | 1785 | | |
| 17:00 | 48 | 146 | 89 | 0 | 68 | 446 | 66 | 3 | 113 | 139 | 64 | 0 | | 88 | 344 | 84 | 6 | | 1704 | | |
| 17:15 | 63 | 156 | 112 | 1 | 46 | 452 | 75 | 2 | 122 | 172 | 59 | 0 | | 104 | 360 | 75 | 5 | | 1804 | | |
| 17:30 | 48 | 146 | 78 | 0 | 60 | 469 | 62 | 1 | 97 | 131 | 55 | 1 | | 96 | 287 | 68 | 7 | | 1606 | | |
| 17:45 | 52 | 115 | 77 | 0 | 65 | 465 | 76 | 4 | 90 | 128 | 49 | 0 | | 74 | 318 | 83 | 7 | | 1603 | | |
| 18:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 18:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 18:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 18:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 19:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 19:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 19:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 19:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 20:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 20:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 20:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 20:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 21:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 21:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 21:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 21:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 22:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 22:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 22:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 22:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| 23:00 | | | | | | | | | | | | | | | | | | | | 0 | |
| 23:15 | | | | | | | | | | | | | | | | | | | | 0 | |
| 23:30 | | | | | | | | | | | | | | | | | | | | 0 | |
| 23:45 | | | | | | | | | | | | | | | | | | | | 0 | |
| Total | 1163 | 2251 | 1374 | 6 | 0 | 889 | 7018 | 1053 | 59 | 0 | 1946 | 2357 | 1001 | 12 | 0 | 1642 | 9076 | 1379 | 143 | 0 | 31369 |
| AM Peak Hr: | | | | | | | | | | | | | | | | | | | | | 7:15 |
| Pk Vol | 253 | 292 | 119 | 1 | 0 | 101 | 697 | 67 | 8 | 0 | 240 | 232 | 119 | 0 | 0 | 207 | 1838 | 228 | 27 | 0 | 4429 |
| PHF | #### | #### | #### | #### | n/a | #### | #### | #### | #### | n/a | #### | #### | #### | n/a | n/a | #### | #### | #### | #### | n/a | 0.944 |
| MID Peak Hr: | | | | | | | | | | | | | | | | | | | | | |
| Pk Vol | | | | | | | | | | | | | | | | | | | | | 0 |
| PHF | | | | | | | | | | | | | | | | | | | | | |
| PM Peak Hr: | | | | | | | | | | | | | | | | | | | | | 16:30 |
| Pk Vol | 200 | 554 | 389 | 4 | | | | | | | | | | | | | | | | | |

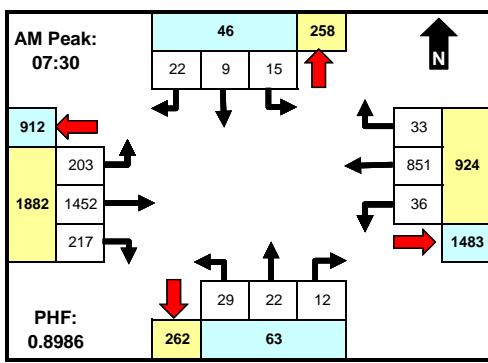


Intersection ID: 1805404
Count Date: 11/13/2018

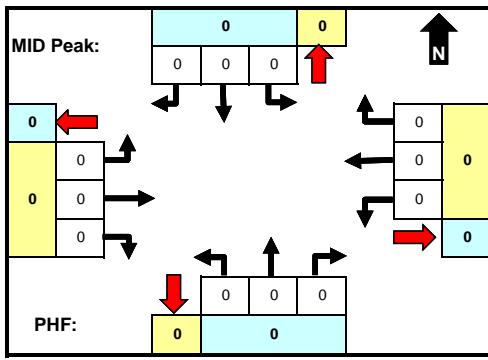


| Time | From North (SB) N 79TH AVE | | | | From East (WB) W BELL RD | | | | From South (NB) N 79TH AVE | | | | From West (EB) W BELL RD | | | | INTSEC | | | |
|-------|-------------------------------|------|----|---|-----------------------------|----|------|----|-------------------------------|------|----|------|-----------------------------|---|------|----|--------|----|----|------|
| | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | Cwlk | LT | Thru | RT | U | |
| 0:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 0:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 0:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 0:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 1:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 1:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 1:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 1:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 2:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 2:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 2:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 2:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 3:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 3:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 3:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 3:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 4:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 4:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 4:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 4:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 5:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 5:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 5:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 5:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 6:00 | 10 | 0 | 3 | 0 | | 1 | 72 | 4 | 0 | | 0 | 0 | 1 | 0 | | 10 | 196 | 2 | 1 | 300 |
| 6:15 | 6 | 2 | 13 | 0 | | 3 | 105 | 3 | 0 | | 0 | 0 | 0 | 0 | | 9 | 310 | 1 | 0 | 452 |
| 6:30 | 15 | 2 | 9 | 0 | | 1 | 133 | 6 | 0 | | 0 | 1 | 0 | 0 | | 7 | 428 | 1 | 2 | 605 |
| 6:45 | 10 | 0 | 10 | 0 | | 1 | 161 | 5 | 0 | | 0 | 1 | 0 | 0 | | 16 | 488 | 3 | 0 | 695 |
| 7:00 | 13 | 2 | 7 | 0 | | 2 | 151 | 6 | 0 | | 2 | 0 | 0 | 0 | | 21 | 547 | 3 | 2 | 756 |
| 7:15 | 14 | 1 | 11 | 0 | | 4 | 178 | 8 | 0 | | 0 | 1 | 0 | 0 | | 11 | 560 | 1 | 6 | 795 |
| 7:30 | 16 | 3 | 14 | 2 | | 3 | 177 | 14 | 0 | | 6 | 1 | 1 | 0 | | 27 | 482 | 11 | 4 | 761 |
| 7:45 | 1 | 6 | 8 | 0 | | 4 | 209 | 15 | 0 | | 3 | 3 | 1 | 0 | | 58 | 442 | 21 | 8 | 779 |
| 8:00 | 13 | 6 | 12 | 3 | | 5 | 228 | 23 | 0 | | 5 | 6 | 1 | 0 | | 48 | 403 | 13 | 9 | 775 |
| 8:15 | 16 | 11 | 11 | 0 | | 14 | 183 | 23 | 0 | | 2 | 1 | 3 | 0 | | 29 | 488 | 8 | 5 | 794 |
| 8:30 | 22 | 7 | 13 | 0 | | 12 | 229 | 15 | 0 | | 7 | 2 | 8 | 0 | | 32 | 345 | 13 | 5 | 710 |
| 8:45 | 27 | 6 | 11 | 0 | | 11 | 187 | 16 | 0 | | 3 | 3 | 3 | 0 | | 32 | 386 | 11 | 6 | 702 |
| 9:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 9:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 9:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 9:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 10:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 10:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 10:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 10:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 11:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 11:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 11:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 11:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 12:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 12:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 12:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 12:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 13:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 13:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 13:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 13:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 14:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 14:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 14:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 14:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 15:00 | 58 | 7 | 60 | 0 | | 26 | 420 | 51 | 5 | | 39 | 12 | 18 | 0 | | 60 | 370 | 21 | 3 | 1150 |
| 15:15 | 71 | 19 | 41 | 0 | | 17 | 417 | 44 | 2 | | 48 | 21 | 19 | 0 | | 74 | 383 | 19 | 14 | 1189 |
| 15:30 | 67 | 20 | 43 | 0 | | 31 | 431 | 58 | 3 | | 48 | 23 | 14 | 0 | | 59 | 373 | 17 | 6 | 1193 |
| 15:45 | 58 | 15 | 50 | 0 | | 24 | 478 | 34 | 3 | | 22 | 17 | 18 | 0 | | 76 | 436 | 21 | 7 | 1259 |
| 16:00 | 53 | 17 | 45 | 1 | | 27 | 520 | 47 | 2 | | 33 | 13 | 17 | 0 | | 94 | 360 | 26 | 7 | 1262 |
| 16:15 | 54 | 15 | 50 | 0 | | 34 | 437 | 46 | 1 | | 48 | 16 | 17 | 0 | | 69 | 331 | 15 | 6 | 1139 |
| 16:30 | 48 | 18 | 43 | 0 | | 25 | 515 | 39 | 1 | | 44 | 17 | 19 | 0 | | 44 | 358 | 17 | 14 | 1202 |
| 16:45 | 44 | 21 | 35 | 0 | | 22 | 464 | 41 | 3 | | 47 | 14 | 19 | 0 | | 74 | 410 | 15 | 2 | 1211 |
| 17:00 | 49 | 20 | 45 | 1 | | 21 | 493 | 46 | 1 | | 32 | 11 | 21 | 0 | | 58 | 350 | 21 | 5 | 1174 |
| 17:15 | 56 | 20 | 72 | 0 | | 23 | 507 | 47 | 1 | | 41 | 13 | 25 | 0 | | 88 | 358 | 15 | 6 | 1272 |
| 17:30 | 52 | 15 | 43 | 0 | | 31 | 524 | 47 | 0 | | 42 | 19 | 19 | 0 | | 69 | 309 | 13 | 5 | 1188 |
| 17:45 | 60 | 18 | 41 | 0 | | 22 | 456 | 51 | 3 | | 35 | 12 | 21 | 0 | | 45 | 377 | 15 | 4 | 1160 |
| 18:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 18:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 18:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 18:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 19:00 | | | | | | | | | | | | | | | | | | | | 0 |
| 19:15 | | | | | | | | | | | | | | | | | | | | 0 |
| 19:30 | | | | | | | | | | | | | | | | | | | | 0 |
| 19:45 | | | | | | | | | | | | | | | | | | | | 0 |
| 20:00 | | | | | | | | | | | | | | | | | | | | |

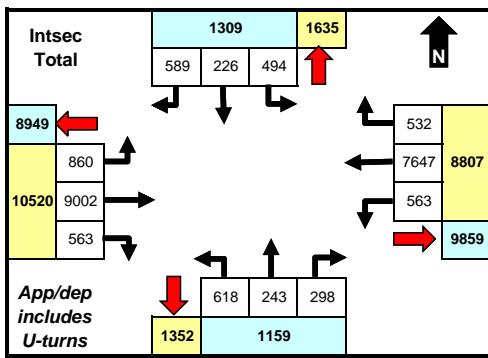
Intersection ID: 1805405
Count Date: 11/13/2018



Weather: Clear



Weather: Partly Cloudy



| | North | | East | | South | | West | | Total |
|-------|-------|------|------|------|-------|------|-------|------|-------|
| | App | Dep | App | Dep | App | Dep | App | Dep | |
| AM | 46 | 258 | 924 | 1483 | 63 | 262 | 1882 | 912 | 2915 |
| MID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PM | 429 | 435 | 2087 | 1841 | 380 | 341 | 1871 | 2150 | 4767 |
| Total | 1309 | 1635 | 8807 | 9859 | 1159 | 1352 | 10520 | 9949 | 27959 |

Comments

Unless shown otherwise, MID period defined as 10:00 AM - 2:00

Comments

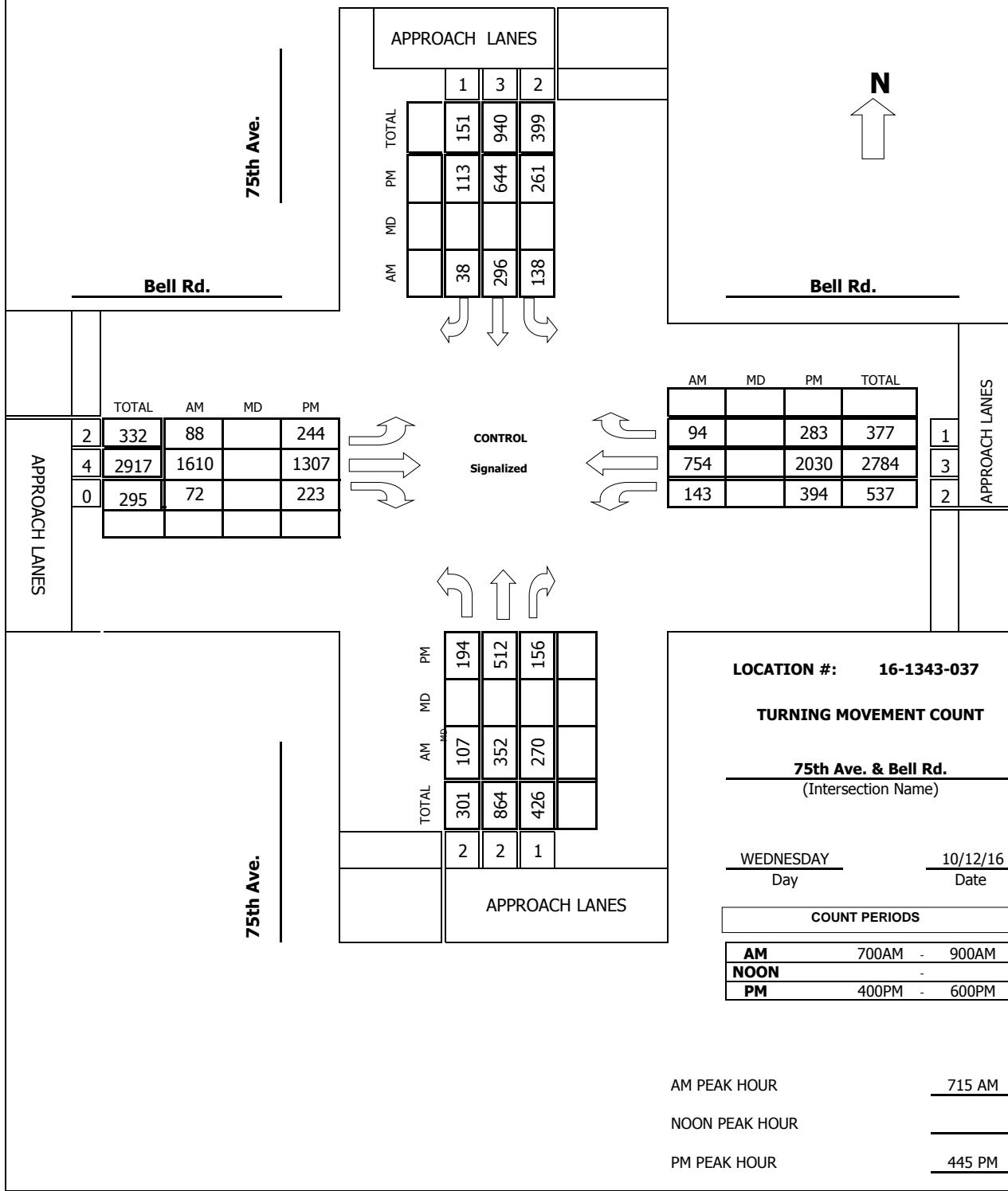
Unless shown otherwise, MID period defined as 10:00 AM - 2:00 PM. Peaks defined based on total intersection volume for all vehicle types. Chart totals do not include crosswalk data.

**Intersection Turning Movement
Prepared by:**

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 16-1343-037

TMC SUMMARY OF 75th Ave. & Bell Rd.





FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: 75th Ave.
E-W STREET: Bell Rd.

Date: 10/12/16
Day: WEDNESDAY

City: Glendale
Project #: 16-1343-037

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 2 | 0 | 0 |
| 7:30 AM | 0 | 0 | 3 | 0 |
| 7:45 AM | 0 | 1 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 2 |
| 8:30 AM | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 3 | 3 | 3 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 1 | 0 | 0 |
| 8:15 AM | 0 | 1 | 0 | 0 |
| 8:30 AM | 0 | 2 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 1 |
| TOTAL | 0 | 4 | 0 | 2 |

| PEDESTRIANS | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 3 | 3 | 1 |
| 4:15 PM | 0 | 1 | 2 | 1 |
| 4:30 PM | 0 | 1 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 1 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 6 | 5 | 2 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 1 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 1 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 1 |
| 5:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 1 | 1 | 1 |

North Leg

East Leg

West Leg

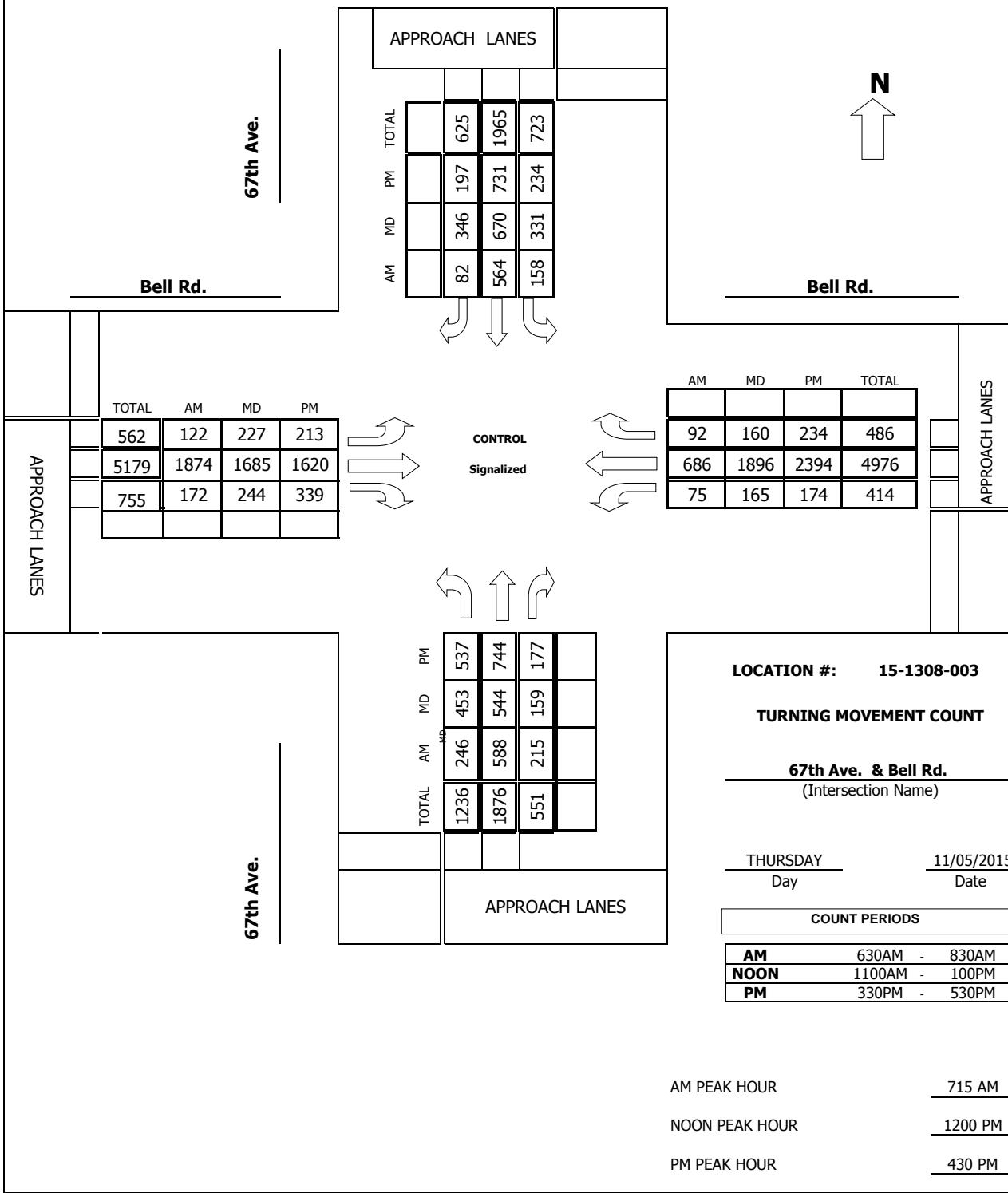
South Leg

**Intersection Turning Movement
Prepared by:**

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1308-003

TMC SUMMARY OF 67th Ave. & Bell Rd.





FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: 67th Ave.
E-W STREET: Bell Rd.

Date: 11/05/2015
Day: THURSDAY

City: Glendale
Project #: 15-1308-00

| PEDESTRIANS | | | | |
|--------------|-----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 6:30 AM | 0 | 0 | 0 | 0 |
| 6:45 AM | 2 | 0 | 2 | 0 |
| 7:00 AM | 0 | 0 | 0 | 2 |
| 7:15 AM | 6 | 1 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 3 | 1 | 3 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 |
| TOTAL | 11 | 2 | 5 | 2 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 6:30 AM | 0 | 0 | 0 | 0 |
| 6:45 AM | 0 | 0 | 0 | 0 |
| 7:00 AM | 1 | 1 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 1 | 0 | 0 |
| TOTAL | 1 | 2 | 0 | 0 |

| PEDESTRIANS | | | | |
|--------------|-----------|-----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 11:00 AM | 3 | 2 | 1 | 1 |
| 11:15 AM | 3 | 1 | 1 | 0 |
| 11:30 AM | 0 | 1 | 0 | 2 |
| 11:45 AM | 3 | 2 | 0 | 0 |
| 12:00 PM | 0 | 1 | 0 | 0 |
| 12:15 PM | 7 | 0 | 4 | 0 |
| 12:30 PM | 2 | 1 | 0 | 2 |
| 12:45 PM | 2 | 2 | 0 | 1 |
| TOTAL | 20 | 10 | 6 | 6 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 11:00 AM | 0 | 0 | 0 | 0 |
| 11:15 AM | 1 | 0 | 0 | 0 |
| 11:30 AM | 0 | 0 | 0 | 0 |
| 11:45 AM | 0 | 1 | 0 | 0 |
| 12:00 PM | 1 | 0 | 0 | 0 |
| 12:15 PM | 0 | 0 | 0 | 0 |
| 12:30 PM | 0 | 0 | 0 | 0 |
| 12:45 PM | 0 | 0 | 0 | 0 |
| TOTAL | 2 | 1 | 0 | 0 |

| PEDESTRIANS | | | | |
|--------------|----------|-----------|----------|-----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 3:30 PM | 0 | 2 | 0 | 1 |
| 3:45 PM | 0 | 2 | 0 | 0 |
| 4:00 PM | 3 | 2 | 0 | 4 |
| 4:15 PM | 0 | 0 | 0 | 1 |
| 4:30 PM | 1 | 0 | 0 | 1 |
| 4:45 PM | 0 | 3 | 0 | 3 |
| 5:00 PM | 0 | 2 | 0 | 5 |
| 5:15 PM | 1 | 1 | 0 | 1 |
| TOTAL | 5 | 12 | 0 | 16 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 3:30 PM | 0 | 0 | 0 | 0 |
| 3:45 PM | 1 | 1 | 0 | 0 |
| 4:00 PM | 0 | 0 | 0 | 1 |
| 4:15 PM | 0 | 1 | 0 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| TOTAL | 1 | 2 | 0 | 2 |



North Leg

West Leg

East Leg



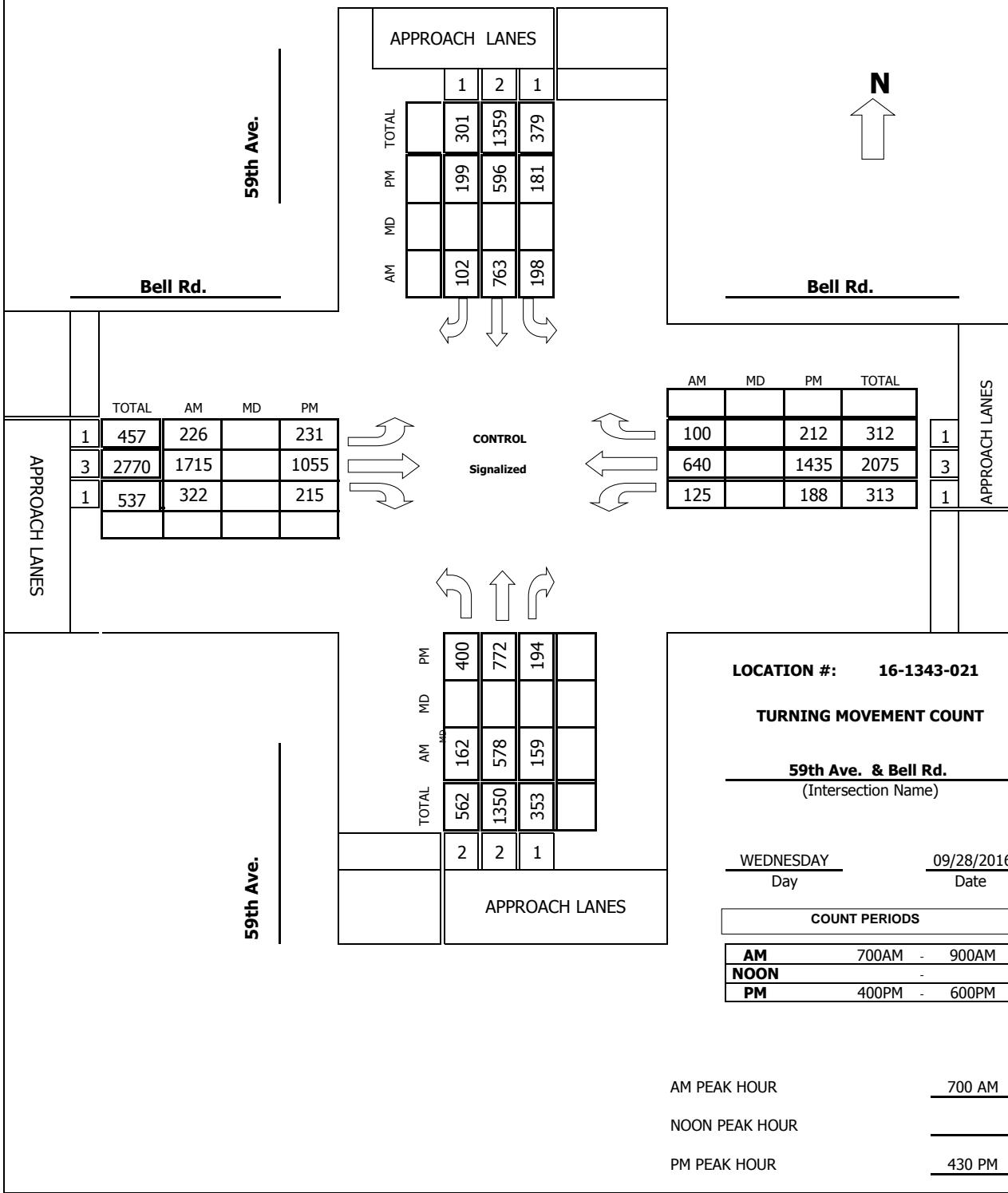
South Leg

Intersection Turning Movement Prepared by:



Project #: 16-1343-021

TMC SUMMARY OF 59th Ave. & Bell Rd.





FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



veracitytrafficgroup

Pedestrian & Bicycle Study

N-S STREET: 59th Ave.
E-W STREET: Bell Rd.

Date: 09/28/2016
Day: WEDNESDAY

City: Glendale
Project #: 16-1343-021

| PEDESTRIANS | | | | |
|--------------|-----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 4 | 0 | 2 | 1 |
| 7:15 AM | 0 | 1 | 0 | 3 |
| 7:30 AM | 3 | 1 | 0 | 0 |
| 7:45 AM | 3 | 3 | 0 | 2 |
| 8:00 AM | 2 | 0 | 0 | 1 |
| 8:15 AM | 3 | 1 | 0 | 1 |
| 8:30 AM | 4 | 1 | 1 | 0 |
| 8:45 AM | 2 | 1 | 1 | 1 |
| TOTAL | 21 | 8 | 4 | 9 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 7:00 AM | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 1 | 2 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 1 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 2 |
| 8:30 AM | 1 | 0 | 0 | 0 |
| 8:45 AM | 0 | 1 | 0 | 0 |
| TOTAL | 1 | 3 | 2 | 2 |

| PEDESTRIANS | | | | |
|--------------|----------|-----------|----------|-----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 2 | 1 | 1 |
| 4:15 PM | 3 | 7 | 3 | 3 |
| 4:30 PM | 0 | 3 | 2 | 3 |
| 4:45 PM | 0 | 3 | 0 | 4 |
| 5:00 PM | 0 | 2 | 1 | 2 |
| 5:15 PM | 1 | 1 | 0 | 6 |
| 5:30 PM | 0 | 0 | 1 | 1 |
| 5:45 PM | 1 | 0 | 0 | 4 |
| TOTAL | 5 | 18 | 8 | 24 |

| BICYCLES | | | | |
|--------------|----------|----------|----------|----------|
| | N-LEG | S-LEG | E-LEG | W-LEG |
| 4:00 PM | 0 | 1 | 0 | 0 |
| 4:15 PM | 0 | 1 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 1 |
| 4:45 PM | 0 | 0 | 2 | 0 |
| 5:00 PM | 0 | 0 | 1 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 1 | 0 |
| TOTAL | 0 | 2 | 4 | 1 |

North Leg

East Leg

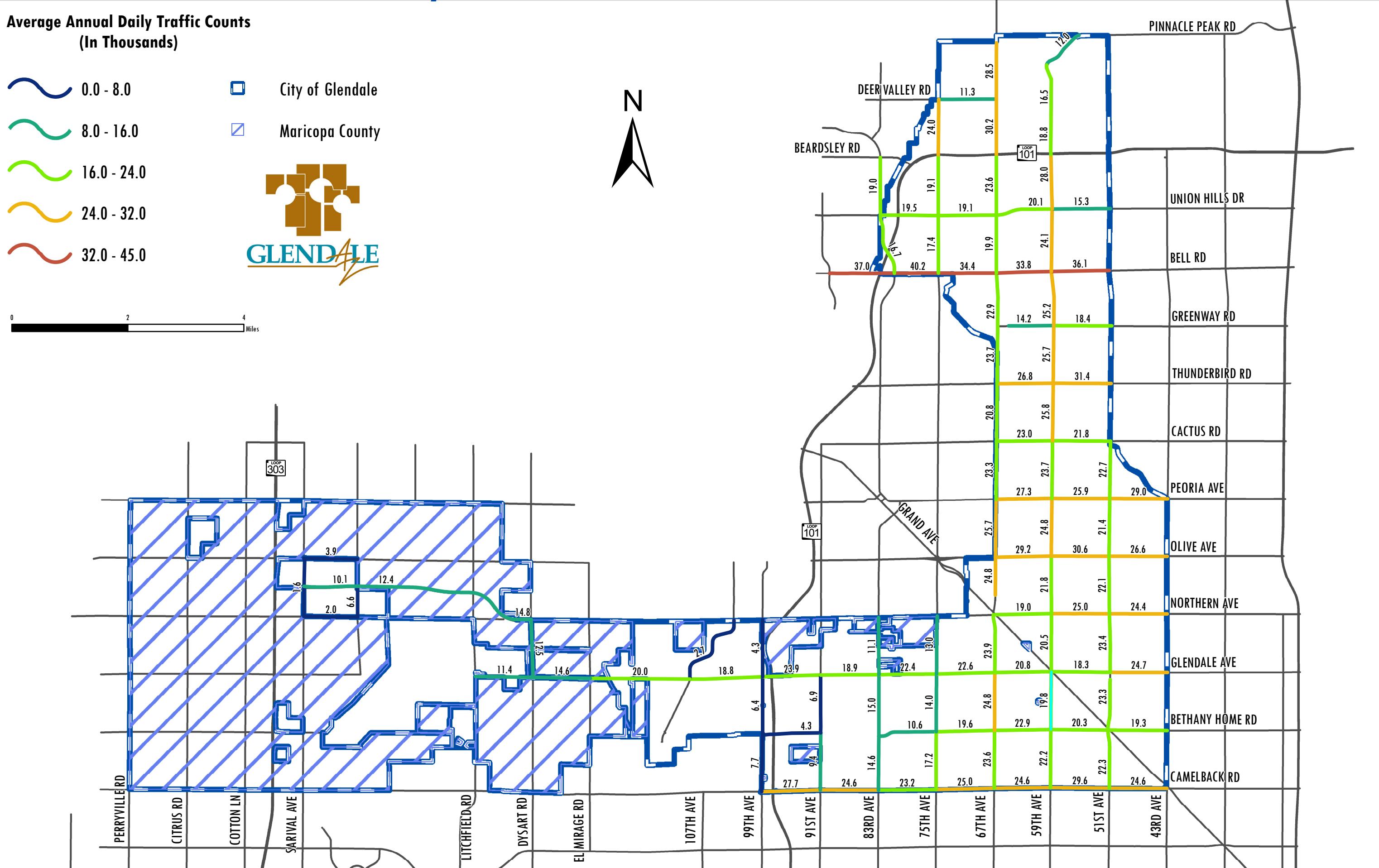
West Leg

South Leg

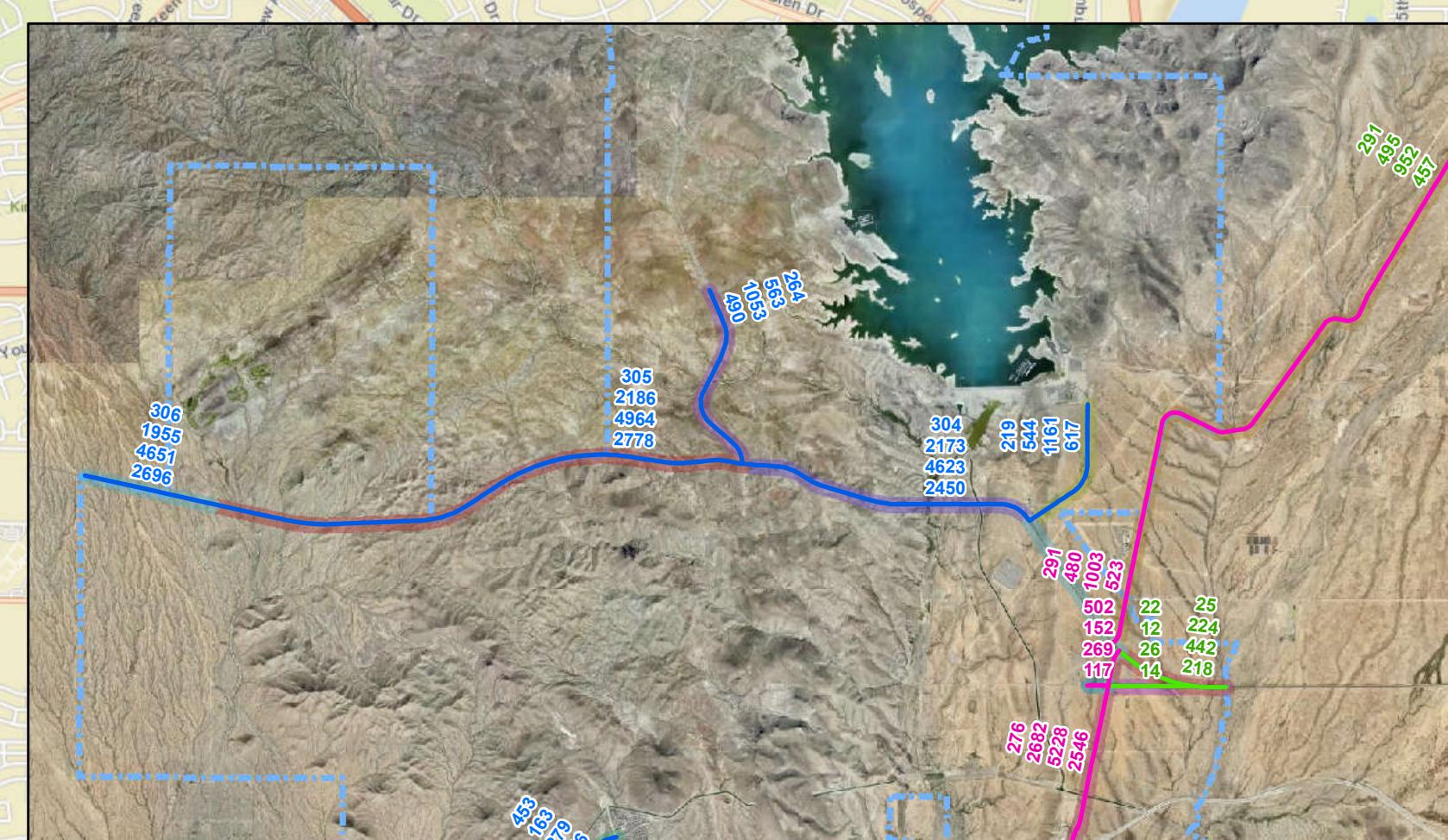
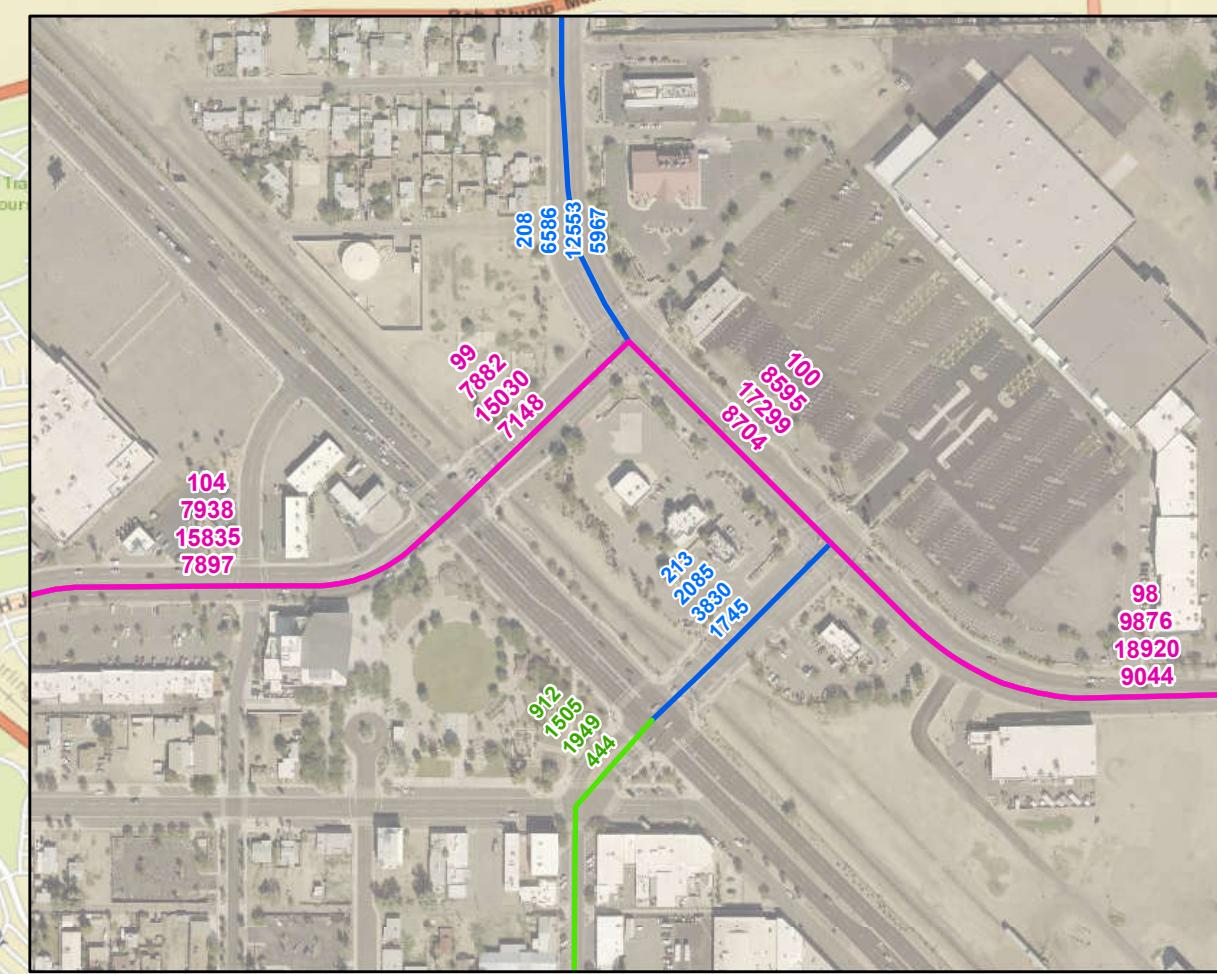
APPENDIX B

Existing and Future Average Daily Traffic Volumes

City of Glendale - Arterial Counts 2015



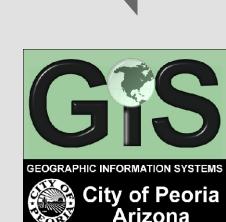
City of Peoria
Annual Daily Traffic Count (ADT) Map
2017



SEG ID 275
 WB 3500
 Total 3600
 EB 3700

Mile Streets
 Half Mile Streets

Count Totals in :
 Red represent 2017
 Green represent 2016
 Blue represent 2015



Legend
 [Box] Peoria Corporate Limits (Line)

SIGNATURE ON FILE
 Approved By:
 Jamal Rahimi, PE
 City Traffic Engineer

N Northern Pkwy

W Northern Ave

W Northern Rd

N Northern Ave

N Northern Rd

N Northern Pkwy

W Northern Ave

W Northern Rd

N Northern Pkwy

W Northern Ave

W Northern Rd

N Northern Pkwy

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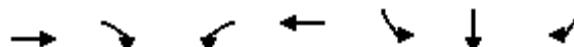
APPENDIX C

Synchro Results

Timings

4: Thunderbird Rd & SR 101L SB Off Ramp

04/09/2019



| Lane Group | EBT | EBR | WBL | WBT | SBL | SBT | SBR | Ø5 | Ø8 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | | ↑ | ↑↓ | ↑↑↑ | ↓ | ↔ | ↑ | | |
| Traffic Volume (vph) | 950 | 381 | 476 | 1144 | 253 | 0 | 542 | | |
| Future Volume (vph) | 950 | 381 | 476 | 1144 | 253 | 0 | 542 | | |
| Turn Type | NA | Perm | Prot | NA | Perm | NA | Perm | | |
| Protected Phases | 2 | | | 1 | 6 | | 4 | 5 | 8 |
| Permitted Phases | | | | 2 | | 4 | | 4 | |
| Detector Phase | 2 | 2 | 1 | 6 | 4 | 4 | 4 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 15.0 | 15.0 | 2.0 | 15.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 33.3 | 33.3 | 33.3 | 33.3 | 34.5 | 34.5 | 34.5 | 24.0 | 34.5 |
| Total Split (s) | 54.0 | 54.0 | 40.0 | 53.0 | 51.0 | 51.0 | 51.0 | 41.0 | 51.0 |
| Total Split (%) | 37.2% | 37.2% | 27.6% | 36.6% | 35.2% | 35.2% | 35.2% | 28% | 35% |
| Yellow Time (s) | 3.9 | 3.9 | 4.3 | 3.9 | 3.0 | 3.0 | 3.0 | 4.3 | 3.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.2 | 1.0 | 5.5 | 5.5 | 5.5 | 1.7 | 5.5 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 4.9 | 4.9 | 5.5 | 4.9 | 8.5 | 8.5 | 8.5 | | |
| Lead/Lag | Lag | Lag | Lead | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max | Max | Max | None |
| Act Effect Green (s) | 54.1 | 54.1 | 29.5 | 48.1 | 42.5 | 42.5 | 42.5 | | |
| Actuated g/C Ratio | 0.37 | 0.37 | 0.20 | 0.33 | 0.29 | 0.29 | 0.29 | | |
| v/c Ratio | 0.37 | 0.49 | 0.76 | 0.74 | 0.50 | 0.50 | 0.47 | | |
| Control Delay | 34.0 | 5.0 | 67.3 | 30.2 | 46.6 | 9.0 | 6.4 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 34.0 | 5.0 | 67.3 | 30.2 | 46.6 | 9.0 | 6.4 | | |
| LOS | C | A | E | C | D | A | A | | |
| Approach Delay | 25.7 | | | 41.1 | | 18.8 | | | |
| Approach LOS | C | | | D | | B | | | |

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 30.9

Intersection LOS: C

Intersection Capacity Utilization 69.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Thunderbird Rd & SR 101L SB Off Ramp



Timings

6: SR 101L NB Off Ramp & Thunderbird Rd

04/09/2019



| Lane Group | EBL | EBT | WBT | WBR | NEL2 | NEL | NER | Ø1 | Ø4 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑↑↑ | ↑ | ↑ | ↑↑ | ↑ | | |
| Traffic Volume (vph) | 267 | 973 | 1101 | 298 | 529 | 0 | 957 | | |
| Future Volume (vph) | 267 | 973 | 1101 | 298 | 529 | 0 | 957 | | |
| Turn Type | Prot | NA | NA | Perm | Perm | Perm | Perm | | |
| Protected Phases | 5 | 2 | 6 | | | | | 1 | 4 |
| Permitted Phases | | | | 6 | 8 | 8 | 8 | | |
| Detector Phase | 5 | 2 | 6 | 6 | 8 | 8 | 8 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 15.0 | 15.0 | 15.0 | 8.0 | 8.0 | 8.0 | 2.0 | 8.0 |
| Minimum Split (s) | 24.0 | 33.3 | 33.3 | 33.3 | 34.5 | 34.5 | 34.5 | 33.3 | 34.5 |
| Total Split (s) | 41.0 | 54.0 | 53.0 | 53.0 | 51.0 | 51.0 | 51.0 | 40.0 | 51.0 |
| Total Split (%) | 28.3% | 37.2% | 36.6% | 36.6% | 35.2% | 35.2% | 35.2% | 28% | 35% |
| Yellow Time (s) | 4.3 | 3.9 | 3.9 | 3.9 | 3.0 | 3.0 | 3.0 | 4.3 | 3.0 |
| All-Red Time (s) | 1.7 | 1.0 | 1.0 | 1.0 | 5.5 | 5.5 | 5.5 | 1.2 | 5.5 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.0 | 4.9 | 4.9 | 4.9 | 8.5 | 8.5 | 8.5 | | |
| Lead/Lag | Lead | Lag | Lag | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | Max | C-Max | C-Max | C-Max | None | None | None | None | Max |
| Act Effect Green (s) | 35.0 | 54.1 | 48.1 | 48.1 | 42.5 | 42.5 | 42.5 | | |
| Actuated g/C Ratio | 0.24 | 0.37 | 0.33 | 0.33 | 0.29 | 0.29 | 0.29 | | |
| v/c Ratio | 0.35 | 0.55 | 0.48 | 0.44 | 1.11 | 0.66 | 0.68 | | |
| Control Delay | 69.7 | 23.5 | 39.4 | 5.4 | 119.9 | 10.2 | 10.8 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 69.7 | 23.5 | 39.4 | 5.4 | 119.9 | 10.2 | 10.8 | | |
| LOS | E | C | D | A | F | B | B | | |
| Approach Delay | | 33.4 | 32.1 | | | 49.5 | | | |
| Approach LOS | | C | C | | | D | | | |

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 38.8

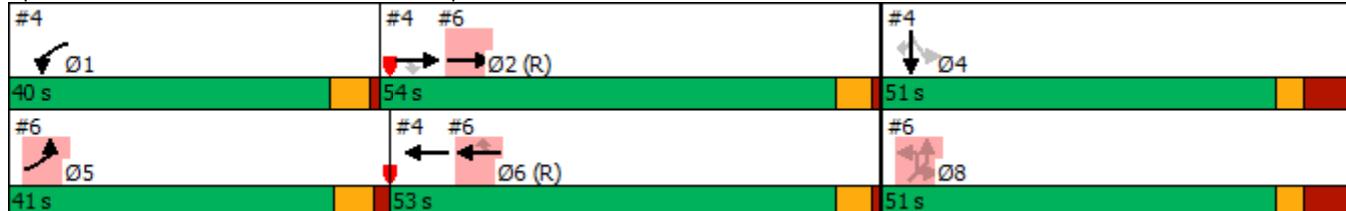
Intersection LOS: D

Intersection Capacity Utilization 69.5%

ICU Level of Service C

Analysis Period (min) 15

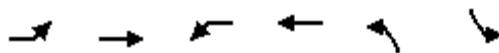
Splits and Phases: 6: SR 101L NB Off Ramp & Thunderbird Rd



Timings

16: SR 101L & Bell Rd

04/09/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | SBL |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑ | ↑↑ | ↑↑↑ | ↑↑ | ↑↑ |
| Traffic Volume (vph) | 735 | 1329 | 261 | 694 | 563 | 246 |
| Future Volume (vph) | 735 | 1329 | 261 | 694 | 563 | 246 |
| Turn Type | Prot | NA | Prot | NA | Prot | Prot |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 1 |
| Permitted Phases | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 1 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 13.0 | 26.0 | 13.1 | 26.1 | 12.3 | 12.1 |
| Total Split (s) | 53.0 | 65.0 | 27.0 | 39.0 | 43.0 | 43.0 |
| Total Split (%) | 39.3% | 48.1% | 20.0% | 28.9% | 31.9% | 31.9% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 3.7 | 3.7 | 3.8 | 3.8 | 3.0 | 2.8 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 8.0 | 8.0 | 8.1 | 8.1 | 7.3 | 7.1 |
| Lead/Lag | Lead | Lag | Lead | Lag | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | C-Max | None | C-Max | None | None |
| Act Effect Green (s) | 37.2 | 65.8 | 16.0 | 44.6 | 29.8 | 30.0 |
| Actuated g/C Ratio | 0.28 | 0.49 | 0.12 | 0.33 | 0.22 | 0.22 |
| v/c Ratio | 0.84 | 0.58 | 0.70 | 0.45 | 0.83 | 0.35 |
| Control Delay | 54.2 | 26.9 | 66.4 | 38.4 | 60.4 | 44.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 54.2 | 26.9 | 66.4 | 38.4 | 60.4 | 44.8 |
| LOS | D | C | E | D | E | D |
| Approach Delay | | 36.6 | | 46.1 | | |
| Approach LOS | | D | | D | | |

Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 63 (47%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 43.0

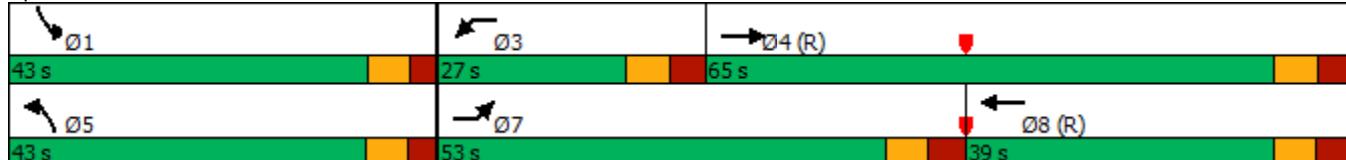
Intersection LOS: D

Intersection Capacity Utilization 69.9%

ICU Level of Service C

Analysis Period (min) 15

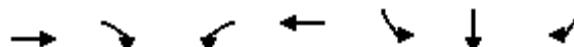
Splits and Phases: 16: SR 101L & Bell Rd



Timings

30: Union Hills Dr & SR 101L SB Off Ramp

04/09/2019



| Lane Group | EBT | EBR | WBL | WBT | SBL | SBT | SBR | Ø5 | Ø8 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑↑↑↑↑ | ↑ | ↑↑ | ↑↑↑↑ | ↑ | ↑↑ | ↑↑ | | |
| Traffic Volume (vph) | 1063 | 312 | 151 | 953 | 209 | 12 | 297 | | |
| Future Volume (vph) | 1063 | 312 | 151 | 953 | 209 | 12 | 297 | | |
| Turn Type | NA | Perm | Prot | NA | Perm | NA | Perm | | |
| Protected Phases | 2 | | | 1 | 6 | | 4 | 5 | 8 |
| Permitted Phases | | | | 2 | | 4 | | 4 | |
| Detector Phase | 2 | 2 | 1 | 6 | 4 | 4 | 4 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 6.0 | 6.0 |
| Minimum Split (s) | 32.2 | 32.2 | 41.0 | 28.2 | 18.0 | 18.0 | 18.0 | 39.7 | 24.0 |
| Total Split (s) | 30.0 | 30.0 | 35.0 | 35.0 | 65.0 | 65.0 | 65.0 | 30.0 | 65.0 |
| Total Split (%) | 23.1% | 23.1% | 26.9% | 26.9% | 50.0% | 50.0% | 50.0% | 23% | 50% |
| Yellow Time (s) | 3.9 | 3.9 | 4.7 | 3.9 | 3.0 | 3.0 | 3.0 | 3.9 | 3.0 |
| All-Red Time (s) | 1.1 | 1.1 | 2.3 | 1.3 | 4.0 | 4.0 | 4.0 | 2.8 | 4.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 5.0 | 5.0 | 7.0 | 5.2 | 7.0 | 7.0 | 7.0 | | |
| Lead/Lag | Lag | Lag | Lead | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max | Max | None | None |
| Act Effect Green (s) | 41.8 | 41.8 | 11.2 | 33.1 | 58.0 | 58.0 | 58.0 | | |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.09 | 0.25 | 0.45 | 0.45 | 0.45 | | |
| v/c Ratio | 0.47 | 0.48 | 0.56 | 0.82 | 0.16 | 0.17 | 0.23 | | |
| Control Delay | 36.4 | 8.3 | 70.4 | 51.8 | 22.2 | 22.3 | 2.6 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 36.4 | 8.3 | 70.4 | 52.5 | 22.2 | 22.3 | 2.6 | | |
| LOS | D | A | E | D | C | C | A | | |
| Approach Delay | 30.0 | | | 55.0 | | 11.0 | | | |
| Approach LOS | C | | | D | | B | | | |

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 35.9

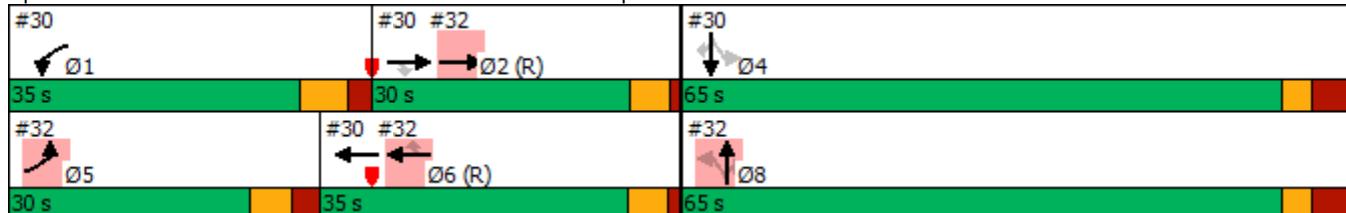
Intersection LOS: D

Intersection Capacity Utilization 49.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 30: Union Hills Dr & SR 101L SB Off Ramp



Timings

32: SR 101L NB Off Ramp & Union Hills Dr

04/09/2019



| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | NBR | Ø1 | Ø4 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑↑↑ | ↑ | ↑ | ↑↑ | ↑ | | |
| Traffic Volume (vph) | 388 | 870 | 482 | 94 | 578 | 0 | 304 | | |
| Future Volume (vph) | 388 | 870 | 482 | 94 | 578 | 0 | 304 | | |
| Turn Type | Prot | NA | NA | Perm | Perm | NA | Perm | | |
| Protected Phases | 5 | 2 | 6 | | | 8 | | 1 | 4 |
| Permitted Phases | | | | 6 | 8 | | 8 | | |
| Detector Phase | 5 | 2 | 6 | 6 | 8 | 8 | 8 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 6.0 | 6.0 | 6.0 | 8.0 | 8.0 |
| Minimum Split (s) | 39.7 | 32.2 | 28.2 | 28.2 | 24.0 | 24.0 | 24.0 | 41.0 | 18.0 |
| Total Split (s) | 30.0 | 30.0 | 35.0 | 35.0 | 65.0 | 65.0 | 65.0 | 35.0 | 65.0 |
| Total Split (%) | 23.1% | 23.1% | 26.9% | 26.9% | 50.0% | 50.0% | 50.0% | 27% | 50% |
| Yellow Time (s) | 3.9 | 3.9 | 3.9 | 3.9 | 3.0 | 3.0 | 3.0 | 4.7 | 3.0 |
| All-Red Time (s) | 2.8 | 1.1 | 1.3 | 1.3 | 4.0 | 4.0 | 4.0 | 2.3 | 4.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.7 | 5.0 | 5.2 | 5.2 | 7.0 | 7.0 | 7.0 | | |
| Lead/Lag | Lead | Lag | Lag | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | None | C-Max | C-Max | C-Max | None | None | None | None | Max |
| Act Effect Green (s) | 20.0 | 41.8 | 33.1 | 33.1 | 58.0 | 58.0 | 58.0 | | |
| Actuated g/C Ratio | 0.15 | 0.32 | 0.25 | 0.25 | 0.45 | 0.45 | 0.45 | | |
| v/c Ratio | 0.79 | 0.57 | 0.27 | 0.21 | 0.44 | 0.44 | 0.37 | | |
| Control Delay | 100.8 | 16.9 | 39.8 | 8.5 | 27.1 | 27.1 | 3.5 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 100.8 | 16.9 | 39.8 | 8.5 | 27.1 | 27.1 | 3.5 | | |
| LOS | F | B | D | A | C | C | A | | |
| Approach Delay | | 42.8 | 34.7 | | | 19.0 | | | |
| Approach LOS | | D | C | | | B | | | |

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 33.4

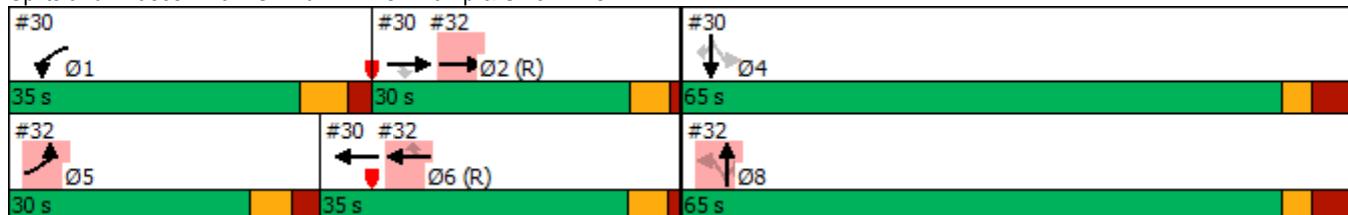
Intersection LOS: C

Intersection Capacity Utilization 49.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 32: SR 101L NB Off Ramp & Union Hills Dr



Timings

40: SR 101L WB Off Ramp & 75th Ave

04/09/2019



| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR | Ø2 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations | ↑ ↗ | ↔ ↔ | ↑ ↗ | ↑ ↗ | ↑ ↑ | ↑↑↑↑ | ↑ ↗ | |
| Traffic Volume (vph) | 271 | 31 | 486 | 90 | 518 | 1276 | 297 | |
| Future Volume (vph) | 271 | 31 | 486 | 90 | 518 | 1276 | 297 | |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm | |
| Protected Phases | | | | 6 | 7 | 4 | 8 | 2 |
| Permitted Phases | 6 | | | | 6 | | | 8 |
| Detector Phase | 6 | 6 | 6 | 7 | 4 | 8 | 8 | |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 8.0 | 6.0 | 15.0 | 15.0 | 8.0 |
| Minimum Split (s) | 28.6 | 28.6 | 28.6 | 31.6 | 28.6 | 29.8 | 29.8 | 26.3 |
| Total Split (s) | 70.0 | 70.0 | 70.0 | 65.0 | 110.0 | 45.0 | 45.0 | 70.0 |
| Total Split (%) | 38.9% | 38.9% | 38.9% | 36.1% | 61.1% | 25.0% | 25.0% | 39% |
| Yellow Time (s) | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.3 | 3.9 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.9 | 4.9 | 4.9 | 5.2 | 7.8 | 5.9 | 5.9 | |
| Lead/Lag | | | | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes | |
| Recall Mode | None | None | None | C-Max | C-Max | Max | Max | Max |
| Act Effect Green (s) | 65.1 | 65.1 | 65.1 | 59.8 | 102.2 | 39.1 | 39.1 | |
| Actuated g/C Ratio | 0.36 | 0.36 | 0.36 | 0.33 | 0.57 | 0.22 | 0.22 | |
| v/c Ratio | 0.35 | 0.32 | 0.38 | 0.17 | 0.28 | 1.00 | 0.62 | |
| Control Delay | 44.3 | 13.2 | 5.5 | 78.7 | 28.2 | 92.7 | 24.5 | |
| Queue Delay | 3.8 | 1.0 | 0.0 | 0.0 | 0.8 | 37.5 | 0.0 | |
| Total Delay | 48.1 | 14.2 | 5.5 | 78.7 | 29.0 | 130.2 | 24.5 | |
| LOS | D | B | A | E | C | F | C | |
| Approach Delay | | 19.7 | | | 36.4 | 110.2 | | |
| Approach LOS | | B | | | D | F | | |

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 29.1 (16%), Referenced to phase 4:SBT and 7:SBL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 71.1

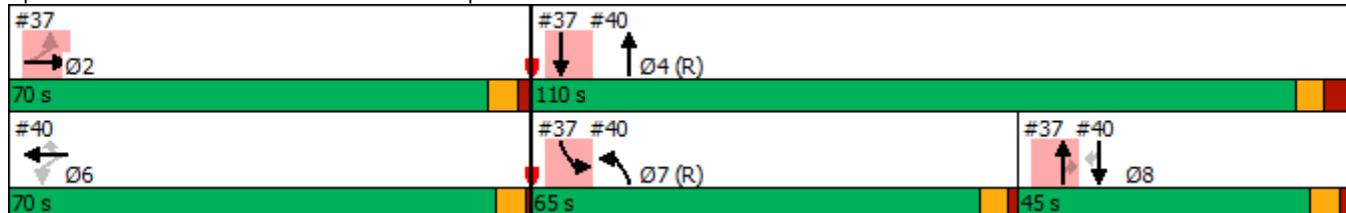
Intersection LOS: E

Intersection Capacity Utilization 68.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 40: SR 101L WB Off Ramp & 75th Ave



Timings

37: 75th Ave & SR 101L EB Off Ramp

04/09/2019



| Lane Group | EBL | EBT | NBT | NBR | SBL | SBT | Ø6 |
|----------------------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations | ↑ ↗ | ↗ ↘ | ↑ ↑ ↗ | ↑ ↗ | ↗ ↘ | ↑ ↑ ↗ | |
| Traffic Volume (vph) | 289 | 62 | 319 | 281 | 1047 | 500 | |
| Future Volume (vph) | 289 | 62 | 319 | 281 | 1047 | 500 | |
| Turn Type | Perm | NA | NA | Perm | Prot | NA | |
| Protected Phases | | 2 | 8 | | 7 | 4 | 6 |
| Permitted Phases | 2 | | | | 8 | | |
| Detector Phase | 2 | 2 | 8 | 8 | 7 | 4 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 15.0 | 15.0 | 8.0 | 6.0 | 10.0 |
| Minimum Split (s) | 26.3 | 26.3 | 29.8 | 29.8 | 31.6 | 28.6 | 28.6 |
| Total Split (s) | 70.0 | 70.0 | 45.0 | 45.0 | 65.0 | 110.0 | 70.0 |
| Total Split (%) | 38.9% | 38.9% | 25.0% | 25.0% | 36.1% | 61.1% | 39% |
| Yellow Time (s) | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.3 | 3.9 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.9 | 5.9 | 5.9 | 5.9 | 5.2 | 7.8 | |
| Lead/Lag | | | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | | |
| Recall Mode | Max | Max | Max | Max | C-Max | C-Max | None |
| Act Effect Green (s) | 64.1 | 64.1 | 39.1 | 39.1 | 59.8 | 102.2 | |
| Actuated g/C Ratio | 0.36 | 0.36 | 0.22 | 0.22 | 0.33 | 0.57 | |
| v/c Ratio | 0.27 | 0.23 | 0.31 | 0.52 | 1.00 | 0.27 | |
| Control Delay | 43.0 | 39.5 | 60.1 | 8.8 | 122.4 | 24.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 40.2 | 1.0 | |
| Total Delay | 43.0 | 39.5 | 60.1 | 8.8 | 162.5 | 25.5 | |
| LOS | D | D | E | A | F | C | |
| Approach Delay | | 40.8 | 36.1 | | | 118.3 | |
| Approach LOS | | D | D | | | F | |

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 29.1 (16%), Referenced to phase 4:SBT and 7:SBL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 87.0

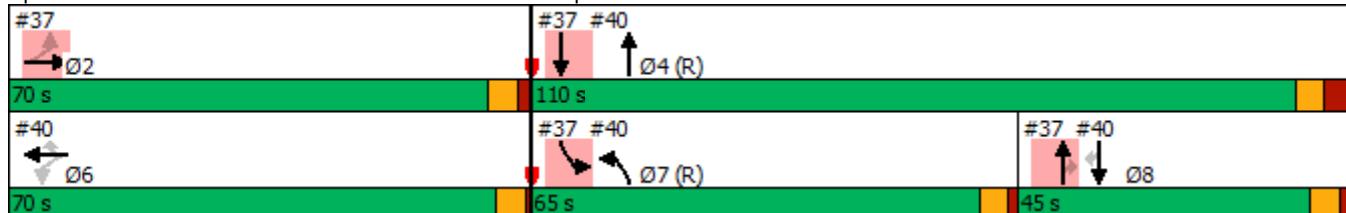
Intersection LOS: F

Intersection Capacity Utilization 68.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 37: 75th Ave & SR 101L EB Off Ramp



Timings

48: SR 101L WB Off Ramp & 67th Ave

04/09/2019



| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR | Ø1 | Ø4 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations | ↑ ↗ | ↑↑ ↗ | ↑ ↗ | ↑ ↗ | ↑↑ | ↑↑↑ | ↑ ↗ | | |
| Traffic Volume (vph) | 522 | 129 | 382 | 157 | 798 | 1506 | 387 | | |
| Future Volume (vph) | 522 | 129 | 382 | 157 | 798 | 1506 | 387 | | |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm | | |
| Protected Phases | | | | 8 | 5 | 2 | 6 | 1 | 4 |
| Permitted Phases | 8 | | | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 5.0 | 6.0 | 6.0 | 6.0 | 10.0 | 8.0 |
| Minimum Split (s) | 31.9 | 31.9 | 31.9 | 28.0 | 27.9 | 25.4 | 25.4 | 29.9 | 25.4 |
| Total Split (s) | 34.0 | 34.0 | 34.0 | 28.0 | 32.0 | 58.0 | 58.0 | 54.0 | 34.0 |
| Total Split (%) | 28.3% | 28.3% | 28.3% | 23.3% | 26.7% | 48.3% | 48.3% | 45% | 28% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 3.9 | 4.3 | 3.9 | 3.9 | 3.9 | 3.9 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.2 | 1.6 | 3.5 | 3.5 | 2.0 | 3.5 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 5.9 | 5.9 | 5.9 | 5.1 | 5.9 | 7.4 | 7.4 | | |
| Lead/Lag | | | | Lead | Lag | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | Max | Max | C-Max | C-Max | C-Max | Max |
| Act Effect Green (s) | 28.1 | 28.1 | 28.1 | 22.9 | 26.1 | 50.6 | 50.6 | | |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.19 | 0.22 | 0.42 | 0.42 | | |
| v/c Ratio | 0.77 | 0.78 | 0.49 | 0.51 | 1.13 | 0.61 | 0.46 | | |
| Control Delay | 57.6 | 49.2 | 7.8 | 45.5 | 105.5 | 28.1 | 3.9 | | |
| Queue Delay | 4.2 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 61.8 | 52.0 | 7.8 | 45.5 | 105.5 | 28.2 | 3.9 | | |
| LOS | E | D | A | D | F | C | A | | |
| Approach Delay | | 44.2 | | | 95.6 | 23.2 | | | |
| Approach LOS | | D | | | F | C | | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 46.6

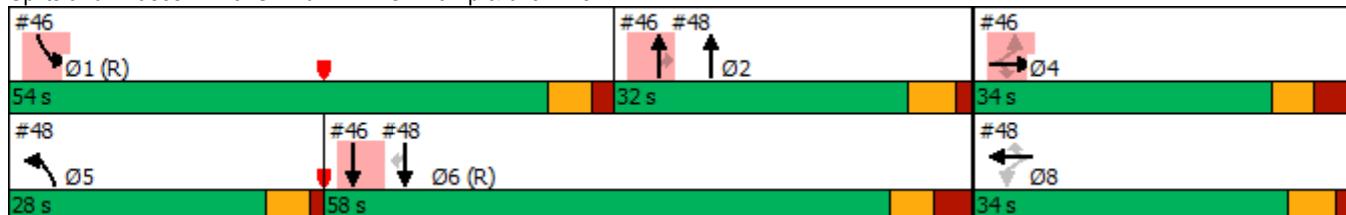
Intersection LOS: D

Intersection Capacity Utilization 78.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 48: SR 101L WB Off Ramp & 67th Ave



Timings

46: 67th Ave & SR 101L EB Off Ramp

04/09/2019



| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT | Ø5 | Ø8 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑ ↗ | ↔ ↔ | ↑ ↗ | ↑↑↑ | ↑ ↗ | ↑ ↗ | ↑↑↑ | | |
| Traffic Volume (vph) | 376 | 265 | 123 | 579 | 364 | 953 | 1075 | | |
| Future Volume (vph) | 376 | 265 | 123 | 579 | 364 | 953 | 1075 | | |
| Turn Type | Perm | NA | Perm | NA | Perm | Prot | NA | | |
| Protected Phases | | | | 4 | 2 | | 1 | 6 | 5 8 |
| Permitted Phases | 4 | | | | 4 | 2 | | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 6.0 | 6.0 | 10.0 | 6.0 | 5.0 | 10.0 |
| Minimum Split (s) | 25.4 | 25.4 | 25.4 | 27.9 | 27.9 | 29.9 | 25.4 | 28.0 | 31.9 |
| Total Split (s) | 34.0 | 34.0 | 34.0 | 32.0 | 32.0 | 54.0 | 58.0 | 28.0 | 34.0 |
| Total Split (%) | 28.3% | 28.3% | 28.3% | 26.7% | 26.7% | 45.0% | 48.3% | 23% | 28% |
| Yellow Time (s) | 3.9 | 3.9 | 3.9 | 4.3 | 4.3 | 3.9 | 3.9 | 3.9 | 4.3 |
| All-Red Time (s) | 3.5 | 3.5 | 3.5 | 1.6 | 1.6 | 2.0 | 3.5 | 1.2 | 1.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 7.4 | 7.4 | 7.4 | 5.9 | 5.9 | 5.9 | 7.4 | | |
| Lead/Lag | | | | Lag | Lag | Lead | Lag | Lag | Lead |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | Max | Max | Max | Max | Max | C-Max | C-Max | Max | None |
| Act Effect Green (s) | 26.6 | 26.6 | 26.6 | 26.1 | 26.1 | 48.1 | 50.6 | | |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.40 | 0.42 | | |
| v/c Ratio | 0.65 | 0.69 | 0.28 | 0.57 | 0.87 | 0.75 | 0.78 | | |
| Control Delay | 52.4 | 48.5 | 6.1 | 44.3 | 50.1 | 45.4 | 21.1 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 11.8 | 0.1 | | |
| Total Delay | 52.4 | 48.5 | 6.1 | 45.3 | 50.1 | 57.2 | 21.2 | | |
| LOS | D | D | A | D | D | E | C | | |
| Approach Delay | | 43.4 | | | 47.1 | | 38.1 | | |
| Approach LOS | | D | | | D | | D | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 107 (89%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 41.5

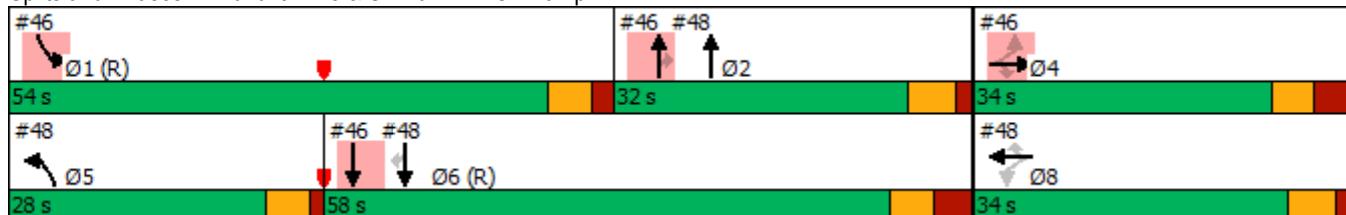
Intersection LOS: D

Intersection Capacity Utilization 78.8%

ICU Level of Service D

Analysis Period (min) 15

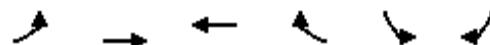
Splits and Phases: 46: 67th Ave & SR 101L EB Off Ramp



Timings

3: Bell Rd & 92nd Ave

02/25/2019



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | ↑↑↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 10 | 1877 | 1419 | 147 | 263 | 13 |
| Future Volume (vph) | 10 | 1877 | 1419 | 147 | 263 | 13 |
| Turn Type | pm+pt | NA | NA | Perm | Perm | Perm |
| Protected Phases | 7 | 4 | 8 | | | |
| Permitted Phases | 4 | | | 8 | 6 | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.8 | 24.1 | 24.1 | 24.1 | 23.6 | 23.6 |
| Total Split (s) | 11.0 | 64.0 | 53.0 | 53.0 | 36.0 | 36.0 |
| Total Split (%) | 11.0% | 64.0% | 53.0% | 53.0% | 36.0% | 36.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.5 | 1.5 | 1.5 | 1.5 | 1.3 | 1.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.6 | 5.6 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | None | None |
| Act Effect Green (s) | 67.2 | 67.2 | 64.8 | 64.8 | 21.4 | 21.4 |
| Actuated g/C Ratio | 0.67 | 0.67 | 0.65 | 0.65 | 0.21 | 0.21 |
| v/c Ratio | 0.05 | 0.60 | 0.47 | 0.15 | 0.75 | 0.04 |
| Control Delay | 7.5 | 10.6 | 2.5 | 0.2 | 49.2 | 13.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 7.5 | 10.6 | 2.5 | 0.2 | 49.2 | 13.2 |
| LOS | A | B | A | A | D | B |
| Approach Delay | | 10.6 | 2.3 | | 47.5 | |
| Approach LOS | | B | A | | D | |

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 12 (12%), Referenced to phase 4:EBTL and 8:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 9.9

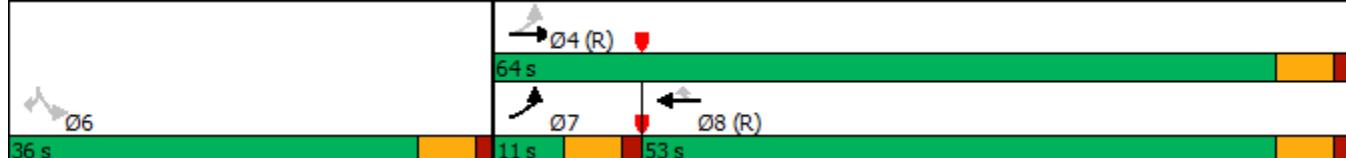
Intersection LOS: A

Intersection Capacity Utilization 60.3%

ICU Level of Service B

Analysis Period (min) 15

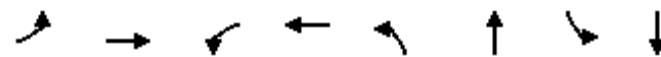
Splits and Phases: 3: Bell Rd & 92nd Ave



Timings

7: Bell Rd & 91st Ave

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ |
| Traffic Volume (vph) | 133 | 1781 | 124 | 1321 | 71 | 179 | 217 | 209 |
| Future Volume (vph) | 133 | 1781 | 124 | 1321 | 71 | 179 | 217 | 209 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | 4 | | | 8 | | 2 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.2 | 24.2 | 11.2 | 24.2 | 10.7 | 23.7 | 10.6 | 23.6 |
| Total Split (s) | 15.0 | 49.6 | 12.4 | 47.0 | 11.7 | 23.8 | 14.2 | 26.3 |
| Total Split (%) | 15.0% | 49.6% | 12.4% | 47.0% | 11.7% | 23.8% | 14.2% | 26.3% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.9 | 1.9 | 1.9 | 1.9 | 1.4 | 1.4 | 1.3 | 1.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 | 5.6 | 5.6 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | None | Max |
| Act Effect Green (s) | 43.4 | 43.4 | 40.8 | 40.8 | 24.1 | 18.1 | 29.9 | 23.0 |
| Actuated g/C Ratio | 0.43 | 0.43 | 0.41 | 0.41 | 0.24 | 0.18 | 0.30 | 0.23 |
| v/c Ratio | 0.62 | 0.92 | 0.73 | 0.79 | 0.27 | 0.46 | 0.76 | 0.40 |
| Control Delay | 36.2 | 26.3 | 43.5 | 28.9 | 26.9 | 24.1 | 45.2 | 27.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 36.2 | 26.3 | 43.5 | 28.9 | 26.9 | 24.1 | 45.2 | 27.9 |
| LOS | D | C | D | C | C | C | D | C |
| Approach Delay | | 27.0 | | 30.0 | | 24.7 | | 35.0 |
| Approach LOS | | C | | C | | C | | D |

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 12 (12%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 28.8

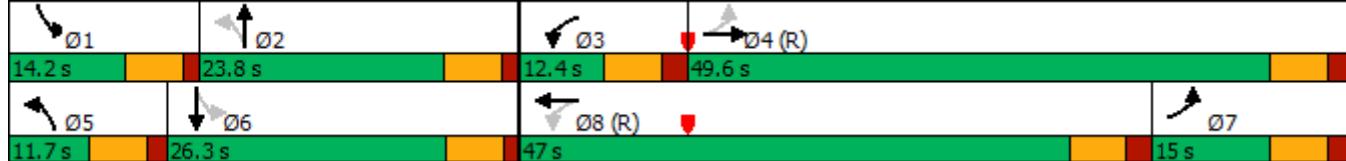
Intersection LOS: C

Intersection Capacity Utilization 83.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 7: Bell Rd & 91st Ave



Timings

12: 87th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↓ | ↑ | ↑↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 75 | 2438 | 168 | 1784 | 104 | 28 | 43 | 112 | 123 | 65 | 38 |
| Future Volume (vph) | 75 | 2438 | 168 | 1784 | 104 | 28 | 43 | 112 | 123 | 65 | 38 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | | 8 | 2 | | 2 | 6 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.3 | 24.3 | 11.3 | 24.3 | 24.3 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 |
| Total Split (s) | 15.4 | 76.0 | 20.0 | 80.6 | 80.6 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| Total Split (%) | 12.8% | 63.3% | 16.7% | 67.2% | 67.2% | 20.0% | 20.0% | 20.0% | 20.0% | 20.0% | 20.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 78.7 | 71.5 | 89.0 | 78.7 | 78.7 | 18.3 | 18.3 | 18.3 | 18.3 | 18.3 | 18.3 |
| Actuated g/C Ratio | 0.66 | 0.60 | 0.74 | 0.66 | 0.66 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| v/c Ratio | 0.43 | 0.89 | 0.77 | 0.58 | 0.11 | 0.15 | 0.17 | 0.35 | 0.65 | 0.25 | 0.13 |
| Control Delay | 15.4 | 26.2 | 49.2 | 13.0 | 3.2 | 46.3 | 46.0 | 11.0 | 63.7 | 47.5 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 15.4 | 26.2 | 49.2 | 13.0 | 3.2 | 46.3 | 46.0 | 11.0 | 63.7 | 47.5 | 0.8 |
| LOS | B | C | D | B | A | D | D | B | E | D | A |
| Approach Delay | | 25.8 | | | 15.5 | | | 24.6 | | 48.5 | |
| Approach LOS | | C | | | B | | | C | | D | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 22.6

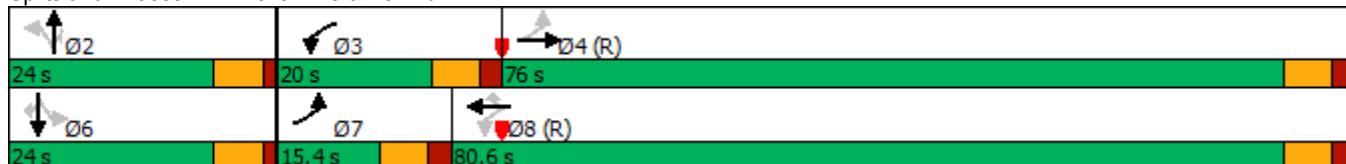
Intersection LOS: C

Intersection Capacity Utilization 86.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 12: 87th Ave & Bell Rd



Timings

17: 84th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|----------------------|-----------|-------------------|-----------|-------------------|-----------|-----------|-----------|-----------|-----------|
| Lane Configurations | ↑ ↗ ↘ ↗ ↘ | ↑ ↑ ↗ ↗ ↗ ↗ ↗ ↗ ↗ | ↑ ↗ ↘ ↗ ↘ | ↑ ↑ ↗ ↗ ↗ ↗ ↗ ↗ ↗ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ |
| Traffic Volume (vph) | 76 | 2246 | 134 | 1892 | 86 | 22 | 1 | 32 | 2 |
| Future Volume (vph) | 76 | 2246 | 134 | 1892 | 86 | 22 | 1 | 32 | 2 |
| Turn Type | Prot | NA | Prot | NA | Perm | pm+pt | NA | pm+pt | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.7 | 23.7 | 10.7 | 23.7 | 23.7 | 11.5 | 24.5 | 11.5 | 24.5 |
| Total Split (s) | 18.0 | 67.3 | 16.6 | 65.9 | 65.9 | 11.5 | 24.5 | 11.6 | 24.6 |
| Total Split (%) | 15.0% | 56.1% | 13.8% | 54.9% | 54.9% | 9.6% | 20.4% | 9.7% | 20.5% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 2.2 | 2.2 | 2.2 | 2.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | C-Max | None | Max | None | Max |
| Act Effect Green (s) | 10.3 | 61.6 | 10.9 | 64.7 | 64.7 | 25.6 | 22.6 | 25.8 | 22.7 |
| Actuated g/C Ratio | 0.09 | 0.51 | 0.09 | 0.54 | 0.54 | 0.21 | 0.19 | 0.22 | 0.19 |
| v/c Ratio | 0.55 | 0.99 | 0.91 | 0.75 | 0.10 | 0.08 | 0.11 | 0.11 | 0.09 |
| Control Delay | 65.9 | 44.3 | 105.7 | 24.6 | 0.8 | 35.5 | 15.8 | 36.1 | 17.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 65.9 | 44.3 | 105.7 | 24.6 | 0.8 | 35.5 | 15.8 | 36.1 | 17.7 |
| LOS | E | D | F | C | A | D | B | D | B |
| Approach Delay | | 45.0 | | 28.8 | | | 23.8 | | 27.9 |
| Approach LOS | | D | | C | | | C | | C |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 37.2

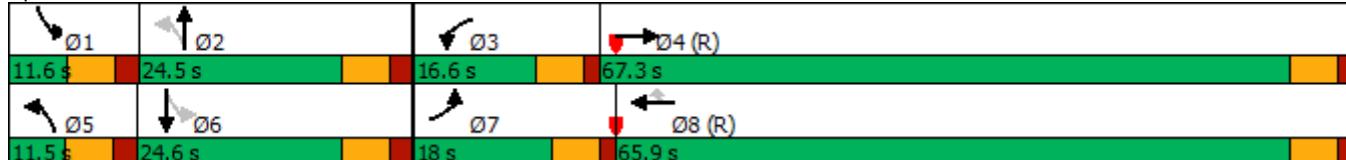
Intersection LOS: D

Intersection Capacity Utilization 76.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 17: 84th Ave & Bell Rd



Timings

11: 83rd Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↖ | ↑↑↑↖ | ↑↖ | ↑↑↑↖ | ↑↖ | ↑↑ | ↑↖ | ↑↖ | ↑↑↑ | ↑↖ |
| Traffic Volume (vph) | 207 | 1838 | 101 | 697 | 240 | 232 | 119 | 253 | 292 | 119 |
| Future Volume (vph) | 207 | 1838 | 101 | 697 | 240 | 232 | 119 | 253 | 292 | 119 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.9 | 24.9 | 11.9 | 24.9 | 12.2 | 25.2 | 25.2 | 12.1 | 25.1 | 25.1 |
| Total Split (s) | 20.7 | 56.0 | 14.0 | 49.3 | 21.0 | 28.0 | 28.0 | 22.0 | 29.0 | 29.0 |
| Total Split (%) | 17.3% | 46.7% | 11.7% | 41.1% | 17.5% | 23.3% | 23.3% | 18.3% | 24.2% | 24.2% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.6 | 2.6 | 2.6 | 2.6 | 2.9 | 2.9 | 2.9 | 2.8 | 2.8 | 2.8 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 6.9 | 7.2 | 7.2 | 7.2 | 7.1 | 7.1 | 7.1 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |
| Act Effect Green (s) | 12.4 | 49.2 | 7.0 | 43.8 | 12.9 | 22.0 | 22.0 | 13.7 | 22.8 | 22.8 |
| Actuated g/C Ratio | 0.10 | 0.41 | 0.06 | 0.36 | 0.11 | 0.18 | 0.18 | 0.11 | 0.19 | 0.19 |
| v/c Ratio | 0.64 | 0.86 | 0.55 | 0.36 | 0.71 | 0.39 | 0.20 | 0.70 | 0.33 | 0.30 |
| Control Delay | 60.0 | 36.3 | 65.6 | 27.9 | 62.6 | 45.6 | 3.6 | 61.1 | 43.4 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 60.0 | 36.3 | 65.6 | 27.9 | 62.6 | 45.6 | 3.6 | 61.1 | 43.4 | 4.6 |
| LOS | E | D | E | C | E | D | A | E | D | A |
| Approach Delay | | 38.4 | | | 32.3 | | 44.1 | | 43.2 | |
| Approach LOS | | D | | C | | D | | | D | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 70 (58%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 38.7

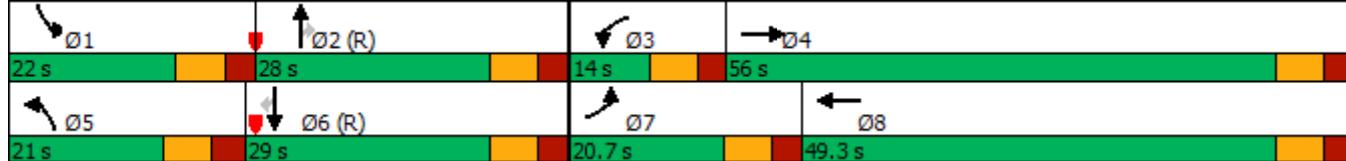
Intersection LOS: D

Intersection Capacity Utilization 71.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 11: 83rd Ave & Bell Rd



Timings

27: 79th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑↑ | ↑ | ↑ | ↑ | ↑ | ↑↑ | ↑ |
| Traffic Volume (vph) | 144 | 1887 | 16 | 792 | 14 | 11 | 3 | 44 | 16 | 45 |
| Future Volume (vph) | 144 | 1887 | 16 | 792 | 14 | 11 | 3 | 44 | 16 | 45 |
| Turn Type | Prot | NA | Prot | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 2 | | 2 | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.9 | 24.9 | 11.7 | 24.7 | 11.6 | 24.6 | 24.6 | 11.4 | 24.4 | 24.4 |
| Total Split (s) | 18.0 | 59.8 | 13.0 | 54.8 | 12.0 | 25.0 | 25.0 | 12.2 | 25.2 | 25.2 |
| Total Split (%) | 16.4% | 54.4% | 11.8% | 49.8% | 10.9% | 22.7% | 22.7% | 11.1% | 22.9% | 22.9% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.6 | 2.6 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.1 | 2.1 | 2.1 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.9 | 6.9 | 6.7 | 6.7 | 6.6 | 6.6 | 6.6 | 6.4 | 6.4 | 6.4 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 9.8 | 63.2 | 5.9 | 51.9 | 23.8 | 18.4 | 18.4 | 26.9 | 23.5 | 23.5 |
| Actuated g/C Ratio | 0.09 | 0.57 | 0.05 | 0.47 | 0.22 | 0.17 | 0.17 | 0.24 | 0.21 | 0.21 |
| v/c Ratio | 0.51 | 0.57 | 0.09 | 0.31 | 0.05 | 0.04 | 0.01 | 0.13 | 0.02 | 0.10 |
| Control Delay | 53.6 | 17.0 | 50.4 | 18.6 | 29.8 | 38.9 | 0.0 | 31.0 | 36.2 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 53.6 | 17.0 | 50.4 | 18.6 | 29.8 | 38.9 | 0.0 | 31.0 | 36.2 | 0.4 |
| LOS | D | B | D | B | C | D | A | C | D | A |
| Approach Delay | | 19.6 | | | 19.2 | | 30.5 | | | 18.6 |
| Approach LOS | | B | | | B | | C | | | B |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 19.5

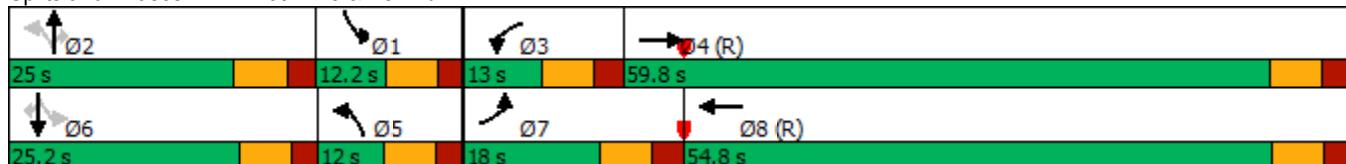
Intersection LOS: B

Intersection Capacity Utilization 58.0%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 27: 79th Ave & Bell Rd



Timings

32: 77th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑ | ↑↑ | ↑↑ | ↑↑ |
| Traffic Volume (vph) | 203 | 1452 | 36 | 851 | 29 | 22 | 15 | 9 | 22 |
| Future Volume (vph) | 203 | 1452 | 36 | 851 | 29 | 22 | 15 | 9 | 22 |
| Turn Type | Prot | NA | Prot | NA | pm+pt | NA | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | 2 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.7 | 24.7 | 11.6 | 24.6 | 11.6 | 24.6 | 11.6 | 24.6 | 24.6 |
| Total Split (s) | 20.0 | 51.0 | 12.0 | 43.0 | 12.0 | 25.0 | 12.0 | 25.0 | 25.0 |
| Total Split (%) | 20.0% | 51.0% | 12.0% | 43.0% | 12.0% | 25.0% | 12.0% | 25.0% | 25.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.7 | 6.7 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | None | Max | Max |
| Act Effect Green (s) | 11.4 | 49.1 | 5.4 | 38.3 | 27.8 | 25.6 | 26.4 | 23.2 | 23.2 |
| Actuated g/C Ratio | 0.11 | 0.49 | 0.05 | 0.38 | 0.28 | 0.26 | 0.26 | 0.23 | 0.23 |
| v/c Ratio | 0.57 | 0.58 | 0.21 | 0.39 | 0.08 | 0.04 | 0.04 | 0.02 | 0.04 |
| Control Delay | 47.6 | 19.4 | 48.1 | 23.1 | 25.6 | 23.5 | 25.1 | 33.9 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 47.6 | 19.4 | 48.1 | 23.1 | 25.6 | 23.5 | 25.1 | 33.9 | 0.1 |
| LOS | D | B | D | C | C | C | C | C | A |
| Approach Delay | | 22.4 | | 24.0 | | 24.5 | | 14.9 | |
| Approach LOS | | C | | C | | C | | B | |

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 22.9

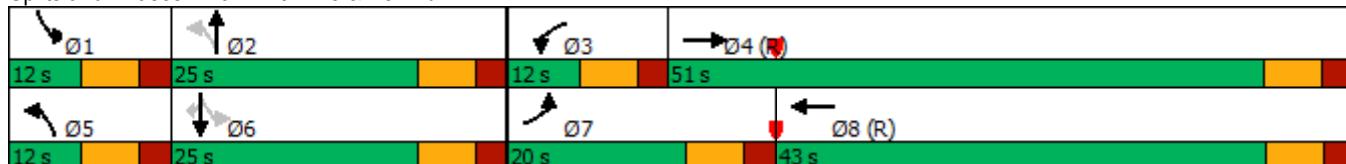
Intersection LOS: C

Intersection Capacity Utilization 53.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 32: 77th Ave & Bell Rd



Timings

37: 75th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑↑ | ↑↑↑↑ | ↑ |
| Traffic Volume (vph) | 92 | 1674 | 149 | 784 | 98 | 111 | 366 | 281 | 144 | 308 | 40 |
| Future Volume (vph) | 92 | 1674 | 149 | 784 | 98 | 111 | 366 | 281 | 144 | 308 | 40 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 12.3 | 25.3 | 12.2 | 25.2 | 25.2 | 11.4 | 24.4 | 24.4 | 11.3 | 24.3 | 24.3 |
| Total Split (s) | 13.9 | 38.5 | 14.0 | 38.6 | 38.6 | 11.8 | 24.5 | 24.5 | 13.0 | 25.7 | 25.7 |
| Total Split (%) | 15.4% | 42.8% | 15.6% | 42.9% | 42.9% | 13.1% | 27.2% | 27.2% | 14.4% | 28.6% | 28.6% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 3.0 | 3.0 | 2.9 | 2.9 | 2.9 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.3 | 7.3 | 7.2 | 7.2 | 7.2 | 6.4 | 6.4 | 6.4 | 6.3 | 6.3 | 6.3 |
| Lead/Lag | Lead | Lead | Lag | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 6.5 | 31.2 | 6.8 | 34.2 | 34.2 | 5.4 | 18.1 | 18.1 | 6.7 | 19.4 | 19.4 |
| Actuated g/C Ratio | 0.07 | 0.35 | 0.08 | 0.38 | 0.38 | 0.06 | 0.20 | 0.20 | 0.07 | 0.22 | 0.22 |
| v/c Ratio | 0.41 | 0.86 | 0.63 | 0.44 | 0.15 | 0.59 | 0.56 | 0.54 | 0.62 | 0.31 | 0.07 |
| Control Delay | 45.1 | 32.1 | 51.7 | 22.5 | 0.4 | 53.6 | 35.9 | 7.9 | 51.5 | 30.6 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 45.1 | 32.1 | 51.7 | 22.5 | 0.4 | 53.6 | 35.9 | 7.9 | 51.5 | 30.6 | 0.2 |
| LOS | D | C | D | C | A | D | D | A | D | C | A |
| Approach Delay | | 32.7 | | 24.6 | | | 28.1 | | | 34.3 | |
| Approach LOS | | C | | C | | | C | | | C | |

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 30.0

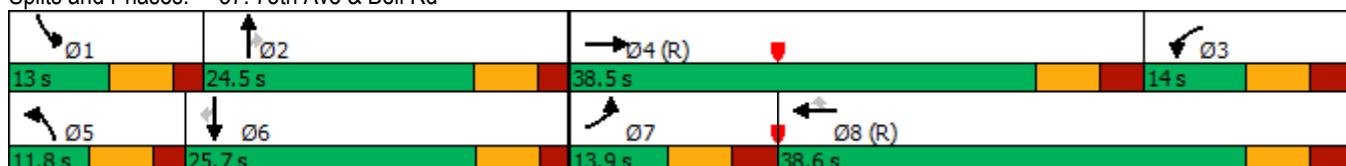
Intersection LOS: C

Intersection Capacity Utilization 66.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 37: 75th Ave & Bell Rd



Timings

42: 73rd Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↗ | ↑↑↗ | ↖ | ↑↑↗ | ↖ | ↖ | ↑ | ↖ | ↖ | ↑ | ↖ |
| Traffic Volume (vph) | 19 | 1908 | 23 | 975 | 40 | 21 | 1 | 95 | 87 | 1 | 20 |
| Future Volume (vph) | 19 | 1908 | 23 | 975 | 40 | 21 | 1 | 95 | 87 | 1 | 20 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | 2 | | 2 | 6 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.3 | 24.3 | 11.3 | 24.3 | 24.3 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 |
| Total Split (s) | 11.6 | 62.4 | 11.6 | 62.4 | 62.4 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 |
| Total Split (%) | 11.6% | 62.4% | 11.6% | 62.4% | 62.4% | 26.0% | 26.0% | 26.0% | 26.0% | 26.0% | 26.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 63.1 | 63.1 | 63.1 | 63.1 | 63.1 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 |
| Actuated g/C Ratio | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| v/c Ratio | 0.06 | 0.65 | 0.15 | 0.33 | 0.04 | 0.08 | 0.00 | 0.23 | 0.35 | 0.00 | 0.05 |
| Control Delay | 9.7 | 13.7 | 10.7 | 9.6 | 0.1 | 34.1 | 33.0 | 1.7 | 39.1 | 33.0 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 9.7 | 13.7 | 10.7 | 9.6 | 0.1 | 34.1 | 33.0 | 1.7 | 39.1 | 33.0 | 0.2 |
| LOS | A | B | B | A | A | C | C | A | D | C | A |
| Approach Delay | | 13.6 | | | 9.3 | | | 7.8 | | 31.8 | |
| Approach LOS | | B | | | A | | | A | | C | |

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 12.6

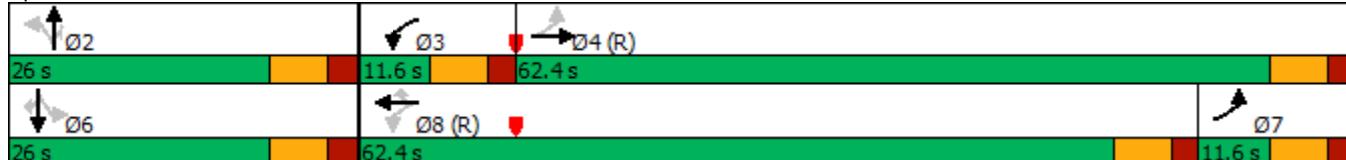
Intersection LOS: B

Intersection Capacity Utilization 64.1%

ICU Level of Service C

Analysis Period (min) 15

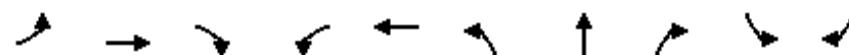
Splits and Phases: 42: 73rd Ave & Bell Rd



Timings

47: 69th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | ↑ | ↑ | ↑↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 17 | 2066 | 7 | 16 | 1001 | 15 | 1 | 61 | 82 | 21 |
| Future Volume (vph) | 17 | 2066 | 7 | 16 | 1001 | 15 | 1 | 61 | 82 | 21 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | NA | Perm | Perm | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | | 2 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 2 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.9 | 23.9 | 23.9 | 10.9 | 23.9 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 |
| Total Split (s) | 12.0 | 82.0 | 82.0 | 12.0 | 82.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 |
| Total Split (%) | 10.0% | 68.3% | 68.3% | 10.0% | 68.3% | 21.7% | 21.7% | 21.7% | 21.7% | 21.7% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 83.3 | 83.3 | 83.3 | 83.3 | 83.3 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 |
| Actuated g/C Ratio | 0.69 | 0.69 | 0.69 | 0.69 | 0.69 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| v/c Ratio | 0.05 | 0.64 | 0.01 | 0.11 | 0.32 | 0.07 | 0.00 | 0.18 | 0.39 | 0.05 |
| Control Delay | 8.0 | 11.9 | 0.0 | 8.9 | 8.0 | 43.5 | 42.0 | 1.0 | 50.3 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 8.0 | 11.9 | 0.0 | 8.9 | 8.0 | 43.5 | 42.0 | 1.0 | 50.3 | 0.2 |
| LOS | A | B | A | A | A | D | D | A | D | A |
| Approach Delay | | 11.8 | | | 8.0 | | 9.7 | | | |
| Approach LOS | | B | | | A | | A | | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 11.4

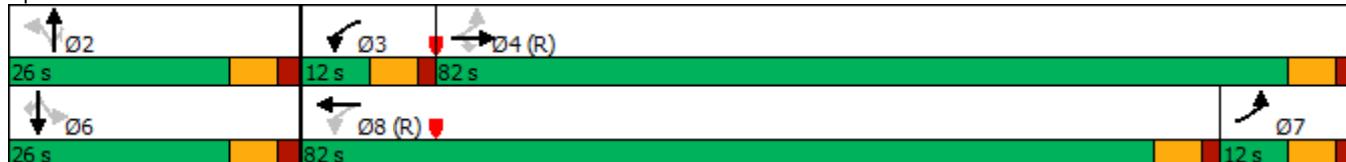
Intersection LOS: B

Intersection Capacity Utilization 64.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 47: 69th Ave & Bell Rd



Timings

52: 67th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | ↑ | ↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑↑ | ↑↑↑ | ↑ |
| Traffic Volume (vph) | 129 | 1986 | 182 | 80 | 727 | 98 | 261 | 623 | 228 | 167 | 598 | 87 |
| Future Volume (vph) | 129 | 1986 | 182 | 80 | 727 | 98 | 261 | 623 | 228 | 167 | 598 | 87 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 12.0 | 25.0 | 25.0 | 12.0 | 25.0 | 25.0 | 11.1 | 24.1 | 24.1 | 10.9 | 23.9 | 23.9 |
| Total Split (s) | 16.0 | 56.0 | 56.0 | 12.0 | 52.0 | 52.0 | 18.1 | 29.0 | 29.0 | 13.0 | 23.9 | 23.9 |
| Total Split (%) | 14.5% | 50.9% | 50.9% | 10.9% | 47.3% | 47.3% | 16.5% | 26.4% | 26.4% | 11.8% | 21.7% | 21.7% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 1.8 | 1.8 | 1.8 | 1.6 | 1.6 | 1.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 6.1 | 6.1 | 6.1 | 5.9 | 5.9 | 5.9 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 51.4 | 51.4 | 51.4 | 45.0 | 45.0 | 45.0 | 11.7 | 22.9 | 22.9 | 7.1 | 18.3 | 18.3 |
| Actuated g/C Ratio | 0.47 | 0.47 | 0.47 | 0.41 | 0.41 | 0.41 | 0.11 | 0.21 | 0.21 | 0.06 | 0.17 | 0.17 |
| v/c Ratio | 0.36 | 0.91 | 0.23 | 0.59 | 0.38 | 0.14 | 0.78 | 0.92 | 0.48 | 0.82 | 0.77 | 0.21 |
| Control Delay | 25.2 | 34.8 | 2.5 | 37.6 | 23.4 | 0.4 | 63.1 | 61.7 | 9.0 | 79.6 | 50.9 | 1.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 25.2 | 34.8 | 2.5 | 37.6 | 23.4 | 0.4 | 63.1 | 61.7 | 9.0 | 79.6 | 50.9 | 1.0 |
| LOS | C | C | A | D | C | A | E | E | A | E | D | A |
| Approach Delay | | 31.7 | | | | 22.2 | | | 51.2 | | 51.4 | |
| Approach LOS | | C | | | | C | | | D | | D | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 37.5

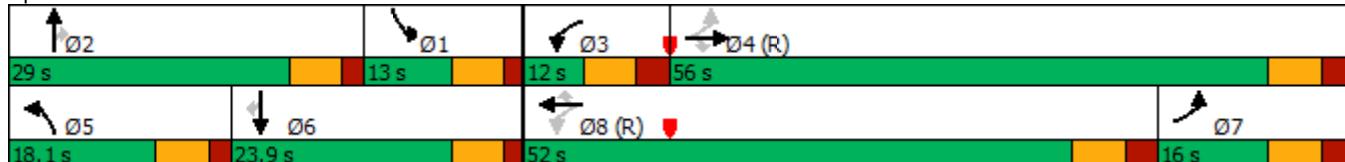
Intersection LOS: D

Intersection Capacity Utilization 86.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 52: 67th Ave & Bell Rd



Timings

57: 63rd Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ |
| Traffic Volume (vph) | 130 | 1976 | 147 | 704 | 57 | 8 | 121 | 253 | 25 | 121 |
| Future Volume (vph) | 130 | 1976 | 147 | 704 | 57 | 8 | 121 | 253 | 25 | 121 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 2 | | 2 | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.8 | 23.8 | 10.8 | 23.8 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 |
| Total Split (s) | 13.4 | 51.6 | 12.4 | 50.6 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 |
| Total Split (%) | 14.9% | 57.3% | 13.8% | 56.2% | 28.9% | 28.9% | 28.9% | 28.9% | 28.9% | 28.9% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.5 | 1.5 | 1.5 | 1.5 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 |
| Lead/Lag | Lead | Lag | Lead | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 53.1 | 45.8 | 51.7 | 45.1 | 19.8 | 19.8 | 19.8 | 19.8 | 19.8 | 19.8 |
| Actuated g/C Ratio | 0.59 | 0.51 | 0.57 | 0.50 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| v/c Ratio | 0.34 | 0.92 | 0.75 | 0.35 | 0.20 | 0.02 | 0.29 | 0.89 | 0.07 | 0.29 |
| Control Delay | 8.7 | 27.7 | 38.9 | 13.4 | 30.9 | 27.9 | 7.4 | 66.2 | 28.4 | 7.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 8.7 | 27.7 | 38.9 | 13.4 | 30.9 | 27.9 | 7.4 | 66.2 | 28.4 | 7.4 |
| LOS | A | C | D | B | C | C | A | E | C | A |
| Approach Delay | | 26.7 | | 17.3 | | 15.5 | | | 46.0 | |
| Approach LOS | | C | | B | | B | | | D | |

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 25.8

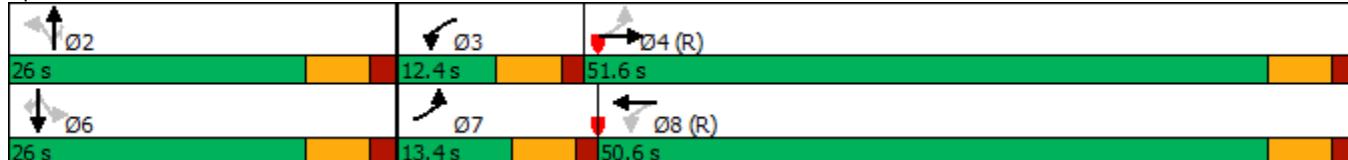
Intersection LOS: C

Intersection Capacity Utilization 86.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 57: 63rd Ave & Bell Rd



Timings

62: 59th Ave & Bell Rd

02/25/2019

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | ↑ | ↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑ | ↑↑↑ | ↑ |
| Traffic Volume (vph) | 235 | 1784 | 335 | 130 | 661 | 104 | 168 | 601 | 165 | 206 | 794 | 106 |
| Future Volume (vph) | 235 | 1784 | 335 | 130 | 661 | 104 | 168 | 601 | 165 | 206 | 794 | 106 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | 8 | | 8 | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.4 | 24.4 | 24.4 | 11.6 | 24.6 | 24.6 | 10.9 | 23.9 | 23.9 | 11.0 | 24.0 | 24.0 |
| Total Split (s) | 24.4 | 50.2 | 50.2 | 12.6 | 38.4 | 38.4 | 12.8 | 27.2 | 27.2 | 20.0 | 34.4 | 34.4 |
| Total Split (%) | 22.2% | 45.6% | 45.6% | 11.5% | 34.9% | 34.9% | 11.6% | 24.7% | 24.7% | 18.2% | 31.3% | 31.3% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.3 | 2.3 | 2.3 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.4 | 6.4 | 6.4 | 6.6 | 6.6 | 6.6 | 5.9 | 5.9 | 5.9 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 55.9 | 43.8 | 43.8 | 41.5 | 35.5 | 35.5 | 6.9 | 21.3 | 21.3 | 14.0 | 28.4 | 28.4 |
| Actuated g/C Ratio | 0.51 | 0.40 | 0.40 | 0.38 | 0.32 | 0.32 | 0.06 | 0.19 | 0.19 | 0.13 | 0.26 | 0.26 |
| v/c Ratio | 0.62 | 0.96 | 0.48 | 0.86 | 0.44 | 0.16 | 0.85 | 0.95 | 0.34 | 1.00 | 0.95 | 0.20 |
| Control Delay | 22.4 | 44.9 | 12.0 | 65.9 | 30.9 | 0.5 | 84.1 | 69.1 | 1.7 | 107.9 | 59.7 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 22.4 | 44.9 | 12.0 | 65.9 | 30.9 | 0.5 | 84.1 | 69.1 | 1.7 | 107.9 | 59.7 | 0.8 |
| LOS | C | D | B | E | C | A | F | E | A | F | E | A |
| Approach Delay | | 38.0 | | | | 32.5 | | | 59.9 | | | 63.1 |
| Approach LOS | | D | | | | C | | | E | | | E |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 46.2

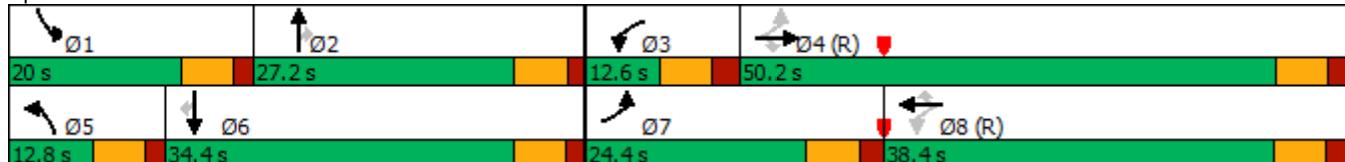
Intersection LOS: D

Intersection Capacity Utilization 90.4%

ICU Level of Service E

Analysis Period (min) 15

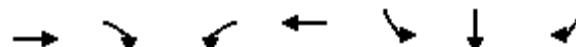
Splits and Phases: 62: 59th Ave & Bell Rd



Timings

4: Thunderbird Rd & SR 101L SB Off Ramp

04/09/2019



| Lane Group | EBT | EBR | WBL | WBT | SBL | SBT | SBR | Ø5 | Ø8 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑↑↑↑ | ↑ | ↑↑ | ↑↑↑↑ | ↑ | ↔ | ↑ | | |
| Traffic Volume (vph) | 1272 | 624 | 762 | 1349 | 346 | 0 | 425 | | |
| Future Volume (vph) | 1272 | 624 | 762 | 1349 | 346 | 0 | 425 | | |
| Turn Type | NA | Perm | Prot | NA | Perm | NA | Perm | | |
| Protected Phases | 2 | | 1 | 6 | | 4 | | 5 | 8 |
| Permitted Phases | | | 2 | | 4 | | 4 | | |
| Detector Phase | 2 | 2 | 1 | 6 | 4 | 4 | 4 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 15.0 | 15.0 | 2.0 | 15.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.9 | 25.9 | 25.3 | 25.3 | 26.5 | 26.5 | 26.5 | 24.0 | 26.5 |
| Total Split (s) | 54.0 | 54.0 | 40.0 | 53.0 | 51.0 | 51.0 | 51.0 | 41.0 | 51.0 |
| Total Split (%) | 37.2% | 37.2% | 27.6% | 36.6% | 35.2% | 35.2% | 35.2% | 28% | 35% |
| Yellow Time (s) | 3.9 | 3.9 | 4.3 | 3.9 | 3.0 | 3.0 | 3.0 | 4.3 | 3.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.2 | 1.0 | 5.5 | 5.5 | 5.5 | 1.7 | 5.5 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 4.9 | 4.9 | 5.5 | 4.9 | 8.5 | 8.5 | 8.5 | | |
| Lead/Lag | Lag | Lag | Lead | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max | Max | Max | None |
| Act Effect Green (s) | 49.1 | 49.1 | 34.5 | 48.1 | 42.5 | 42.5 | 42.5 | | |
| Actuated g/C Ratio | 0.34 | 0.34 | 0.24 | 0.33 | 0.29 | 0.29 | 0.29 | | |
| v/c Ratio | 0.54 | 0.72 | 1.00 | 0.86 | 0.58 | 0.55 | 0.42 | | |
| Control Delay | 39.7 | 9.9 | 94.9 | 34.4 | 49.3 | 34.6 | 6.4 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 39.7 | 9.9 | 94.9 | 34.4 | 49.3 | 34.6 | 6.4 | | |
| LOS | D | A | F | C | D | C | A | | |
| Approach Delay | 29.9 | | | 56.3 | | 30.7 | | | |
| Approach LOS | C | | | E | | C | | | |

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 41.7

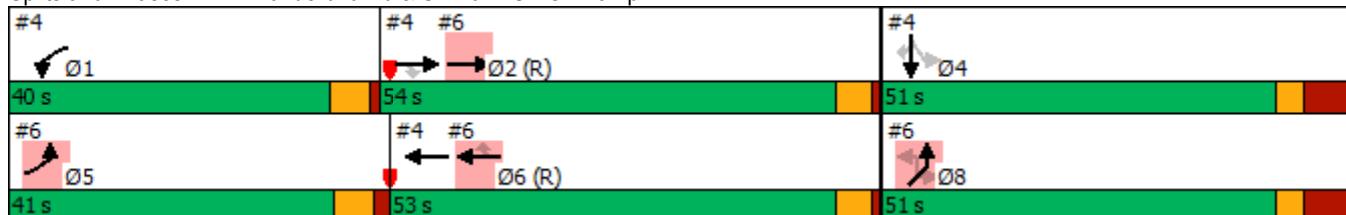
Intersection LOS: D

Intersection Capacity Utilization 90.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 4: Thunderbird Rd & SR 101L SB Off Ramp



Timings

6: SR 101L NB Off Ramp & Thunderbird Rd

04/09/2019



| Lane Group | EBL | EBT | WBT | WBR | NEL2 | NEL | NER | Ø1 | Ø4 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑↑↑ | ↑ | ↑ | ↑↑ | ↑ | | |
| Traffic Volume (vph) | 475 | 1144 | 1739 | 298 | 442 | 0 | 759 | | |
| Future Volume (vph) | 475 | 1144 | 1739 | 298 | 442 | 0 | 759 | | |
| Turn Type | Prot | NA | NA | Perm | Perm | Prot | Perm | | |
| Protected Phases | 5 | 2 | 6 | | | 8 | | 1 | 4 |
| Permitted Phases | | | | 6 | 8 | | 8 | | |
| Detector Phase | 5 | 2 | 6 | 6 | 8 | 8 | 8 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 15.0 | 15.0 | 15.0 | 8.0 | 8.0 | 8.0 | 2.0 | 8.0 |
| Minimum Split (s) | 24.0 | 25.9 | 25.3 | 25.3 | 26.5 | 26.5 | 26.5 | 25.3 | 26.5 |
| Total Split (s) | 41.0 | 54.0 | 53.0 | 53.0 | 51.0 | 51.0 | 51.0 | 40.0 | 51.0 |
| Total Split (%) | 28.3% | 37.2% | 36.6% | 36.6% | 35.2% | 35.2% | 35.2% | 28% | 35% |
| Yellow Time (s) | 4.3 | 3.9 | 3.9 | 3.9 | 3.0 | 3.0 | 3.0 | 4.3 | 3.0 |
| All-Red Time (s) | 1.7 | 1.0 | 1.0 | 1.0 | 5.5 | 5.5 | 5.5 | 1.2 | 5.5 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.0 | 4.9 | 4.9 | 4.9 | 8.5 | 8.5 | 8.5 | | |
| Lead/Lag | Lead | Lag | Lag | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | Max | C-Max | C-Max | C-Max | None | None | None | None | Max |
| Act Effect Green (s) | 35.0 | 49.1 | 48.1 | 48.1 | 42.5 | 42.5 | 42.5 | | |
| Actuated g/C Ratio | 0.24 | 0.34 | 0.33 | 0.33 | 0.29 | 0.29 | 0.29 | | |
| v/c Ratio | 0.62 | 0.71 | 0.75 | 0.47 | 0.92 | 0.52 | 0.54 | | |
| Control Delay | 72.5 | 25.6 | 45.3 | 13.1 | 73.2 | 4.1 | 4.3 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 72.5 | 25.6 | 45.3 | 13.1 | 73.2 | 4.1 | 4.3 | | |
| LOS | E | C | D | B | E | A | A | | |
| Approach Delay | | 39.3 | 40.6 | | | 29.6 | | | |
| Approach LOS | | D | D | | | C | | | |

Intersection Summary

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 37.5

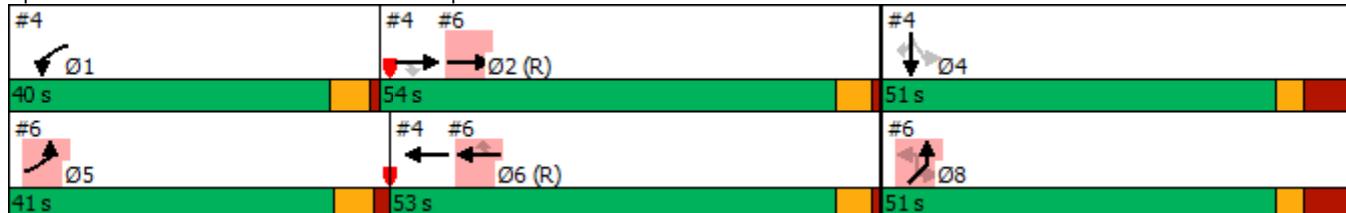
Intersection LOS: D

Intersection Capacity Utilization 90.0%

ICU Level of Service E

Analysis Period (min) 15

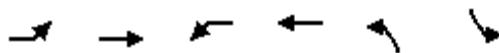
Splits and Phases: 6: SR 101L NB Off Ramp & Thunderbird Rd



Timings

16: SR 101L & Bell Rd

04/09/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | SBL |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑ | ↑↑ | ↑↑↑ | ↑↑ | ↑↑ |
| Traffic Volume (vph) | 816 | 1182 | 884 | 1481 | 432 | 317 |
| Future Volume (vph) | 816 | 1182 | 884 | 1481 | 432 | 317 |
| Turn Type | Prot | NA | Prot | NA | Prot | Prot |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 1 |
| Permitted Phases | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 1 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 13.0 | 26.0 | 13.1 | 26.1 | 12.3 | 12.1 |
| Total Split (s) | 42.0 | 45.9 | 46.3 | 50.2 | 27.8 | 27.8 |
| Total Split (%) | 35.0% | 38.3% | 38.6% | 41.8% | 23.2% | 23.2% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 3.7 | 3.7 | 3.8 | 3.8 | 3.0 | 2.8 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 8.0 | 8.0 | 8.1 | 8.1 | 7.3 | 7.1 |
| Lead/Lag | Lead | Lag | Lead | Lag | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None |
| Act Effect Green (s) | 33.2 | 38.9 | 36.7 | 42.3 | 21.0 | 21.2 |
| Actuated g/C Ratio | 0.28 | 0.32 | 0.31 | 0.35 | 0.18 | 0.18 |
| v/c Ratio | 0.92 | 0.77 | 0.91 | 0.89 | 0.78 | 0.57 |
| Control Delay | 58.0 | 40.3 | 31.2 | 61.1 | 57.6 | 49.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 58.0 | 40.3 | 31.2 | 61.1 | 57.6 | 49.6 |
| LOS | E | D | C | E | E | D |
| Approach Delay | | 47.5 | | 49.9 | | |
| Approach LOS | | D | | D | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 38 (32%), Referenced to phase 2: and 6:, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 49.6

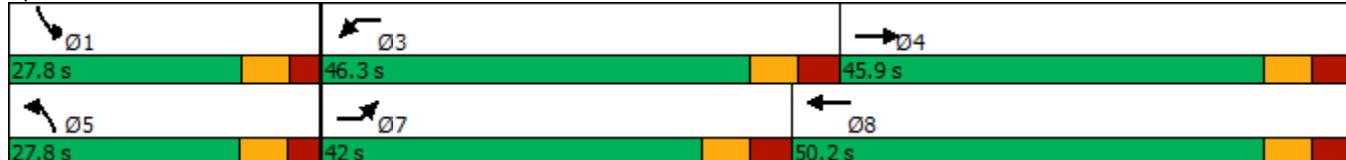
Intersection LOS: D

Intersection Capacity Utilization 83.7%

ICU Level of Service E

Analysis Period (min) 15

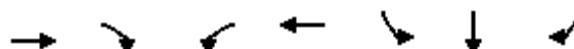
Splits and Phases: 16: SR 101L & Bell Rd



Timings

30: Union Hills Dr & SR 101L SB Off Ramp

04/09/2019



| Lane Group | EBT | EBR | WBL | WBT | SBL | SBT | SBR | Ø5 | Ø8 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑↑↑↑ | ↑ | ↑↑ | ↑↑↑↑ | ↑ | ↑↑ | ↑↑ | | |
| Traffic Volume (vph) | 1160 | 430 | 287 | 1844 | 177 | 0 | 479 | | |
| Future Volume (vph) | 1160 | 430 | 287 | 1844 | 177 | 0 | 479 | | |
| Turn Type | NA | Perm | Prot | NA | Perm | NA | Perm | | |
| Protected Phases | 2 | | 1 | 6 | | 4 | | 5 | 8 |
| Permitted Phases | | | 2 | | 4 | | 4 | | |
| Detector Phase | 2 | 2 | 1 | 6 | 4 | 4 | 4 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 6.0 | 6.0 |
| Minimum Split (s) | 30.0 | 30.0 | 41.0 | 26.2 | 25.2 | 25.2 | 25.2 | 39.7 | 25.0 |
| Total Split (s) | 30.0 | 30.0 | 35.0 | 35.0 | 65.0 | 65.0 | 65.0 | 30.0 | 65.0 |
| Total Split (%) | 23.1% | 23.1% | 26.9% | 26.9% | 50.0% | 50.0% | 50.0% | 23% | 50% |
| Yellow Time (s) | 3.9 | 3.9 | 4.7 | 3.9 | 3.0 | 3.0 | 3.0 | 3.9 | 3.0 |
| All-Red Time (s) | 1.1 | 1.1 | 2.3 | 1.3 | 4.0 | 4.0 | 4.0 | 2.8 | 4.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 5.0 | 5.0 | 7.0 | 5.2 | 7.0 | 7.0 | 7.0 | | |
| Lead/Lag | Lag | Lag | Lead | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max | Max | None | None |
| Act Effect Green (s) | 36.6 | 36.6 | 16.4 | 30.8 | 58.0 | 58.0 | 58.0 | | |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.13 | 0.24 | 0.45 | 0.45 | 0.45 | | |
| v/c Ratio | 0.58 | 0.65 | 0.71 | 1.63 | 0.13 | 0.13 | 0.33 | | |
| Control Delay | 41.9 | 13.3 | 73.4 | 316.1 | 21.8 | 21.8 | 2.3 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 41.9 | 13.3 | 73.4 | 316.1 | 21.8 | 21.8 | 2.3 | | |
| LOS | D | B | E | F | C | C | A | | |
| Approach Delay | 34.2 | | | 283.4 | | 7.6 | | | |
| Approach LOS | C | | | F | | A | | | |

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.63

Intersection Signal Delay: 151.5

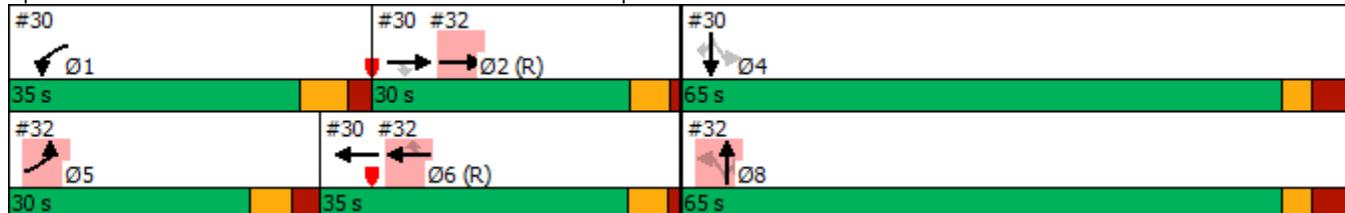
Intersection LOS: F

Intersection Capacity Utilization 68.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 30: Union Hills Dr & SR 101L SB Off Ramp



Timings

32: SR 101L NB Off Ramp & Union Hills Dr

04/09/2019



| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | NBR | Ø1 | Ø4 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑↑↑ | ↑ | ↑ | ↑↑ | ↑ | | |
| Traffic Volume (vph) | 488 | 838 | 1201 | 190 | 885 | 0 | 190 | | |
| Future Volume (vph) | 488 | 838 | 1201 | 190 | 885 | 0 | 190 | | |
| Turn Type | Prot | NA | NA | Perm | Perm | NA | Perm | | |
| Protected Phases | 5 | 2 | 6 | | | 8 | | 1 | 4 |
| Permitted Phases | | | | 6 | 8 | | 8 | | |
| Detector Phase | 5 | 2 | 6 | 6 | 8 | 8 | 8 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 6.0 | 8.0 | 8.0 | 8.0 | 6.0 | 6.0 | 6.0 | 8.0 | 8.0 |
| Minimum Split (s) | 39.7 | 30.0 | 26.2 | 26.2 | 25.0 | 25.0 | 25.0 | 41.0 | 25.2 |
| Total Split (s) | 30.0 | 30.0 | 35.0 | 35.0 | 65.0 | 65.0 | 65.0 | 35.0 | 65.0 |
| Total Split (%) | 23.1% | 23.1% | 26.9% | 26.9% | 50.0% | 50.0% | 50.0% | 27% | 50% |
| Yellow Time (s) | 3.9 | 3.9 | 3.9 | 3.9 | 3.0 | 3.0 | 3.0 | 4.7 | 3.0 |
| All-Red Time (s) | 2.8 | 1.1 | 1.3 | 1.3 | 4.0 | 4.0 | 4.0 | 2.3 | 4.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.7 | 5.0 | 5.2 | 5.2 | 7.0 | 7.0 | 7.0 | | |
| Lead/Lag | Lead | Lag | Lag | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | None | C-Max | C-Max | C-Max | None | None | None | None | Max |
| Act Effect Green (s) | 22.3 | 36.6 | 30.8 | 30.8 | 58.0 | 58.0 | 58.0 | | |
| Actuated g/C Ratio | 0.17 | 0.28 | 0.24 | 0.24 | 0.45 | 0.45 | 0.45 | | |
| v/c Ratio | 0.88 | 0.63 | 0.72 | 0.38 | 0.64 | 0.64 | 0.25 | | |
| Control Delay | 103.6 | 16.8 | 48.4 | 7.5 | 32.5 | 32.5 | 3.5 | | |
| Queue Delay | 0.0 | 0.0 | 18.0 | 0.0 | 0.5 | 0.5 | 0.0 | | |
| Total Delay | 103.6 | 16.8 | 66.4 | 7.5 | 33.0 | 33.0 | 3.5 | | |
| LOS | F | B | E | A | C | C | A | | |
| Approach Delay | | 48.8 | 58.3 | | | 27.8 | | | |
| Approach LOS | | D | E | | C | | | | |

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.63

Intersection Signal Delay: 46.3

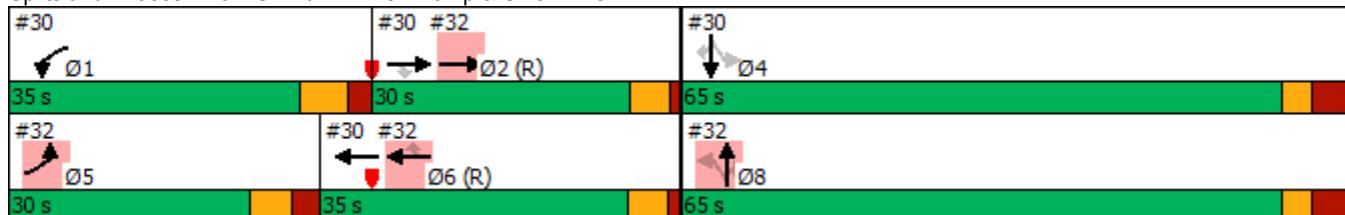
Intersection LOS: D

Intersection Capacity Utilization 68.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 32: SR 101L NB Off Ramp & Union Hills Dr



Timings

40: SR 101L WB Off Ramp & 75th Ave

04/09/2019



| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR | Ø2 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations | ↑ | ↔↔ | ↑ | ↑ | ↑↑ | ↑↑↑ | ↑ | |
| Traffic Volume (vph) | 555 | 112 | 859 | 155 | 1004 | 984 | 311 | |
| Future Volume (vph) | 555 | 112 | 859 | 155 | 1004 | 984 | 311 | |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm | |
| Protected Phases | | | | 6 | 7 | 4 | 8 | 2 |
| Permitted Phases | 6 | | | | 6 | | | 8 |
| Detector Phase | 6 | 6 | 6 | 7 | 4 | 8 | 8 | |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 8.0 | 6.0 | 15.0 | 15.0 | 8.0 |
| Minimum Split (s) | 23.7 | 23.7 | 23.7 | 31.2 | 25.8 | 27.9 | 27.9 | 25.9 |
| Total Split (s) | 58.0 | 58.0 | 58.0 | 36.0 | 77.0 | 32.0 | 32.0 | 58.0 |
| Total Split (%) | 43.0% | 43.0% | 43.0% | 26.7% | 57.0% | 23.7% | 23.7% | 43% |
| Yellow Time (s) | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.3 | 3.9 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.9 | 4.9 | 4.9 | 5.2 | 7.8 | 5.9 | 5.9 | |
| Lead/Lag | | | | Lead | | Lag | Lag | |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes | |
| Recall Mode | Max | Max | Max | C-Max | C-Max | Max | Max | Max |
| Act Effect Green (s) | 53.1 | 53.1 | 53.1 | 30.8 | 69.2 | 35.1 | 35.1 | |
| Actuated g/C Ratio | 0.39 | 0.39 | 0.39 | 0.23 | 0.51 | 0.26 | 0.26 | |
| v/c Ratio | 0.66 | 0.66 | 0.76 | 0.42 | 0.60 | 0.64 | 0.51 | |
| Control Delay | 39.5 | 33.9 | 38.3 | 70.1 | 25.6 | 46.5 | 6.9 | |
| Queue Delay | 10.4 | 6.4 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | |
| Total Delay | 49.9 | 40.2 | 38.3 | 70.1 | 27.1 | 46.5 | 6.9 | |
| LOS | D | D | D | E | C | D | A | |
| Approach Delay | | 42.1 | | | 32.8 | 37.0 | | |
| Approach LOS | | D | | | C | D | | |

Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 62 (46%), Referenced to phase 4:SBT and 7:SBL, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 37.7

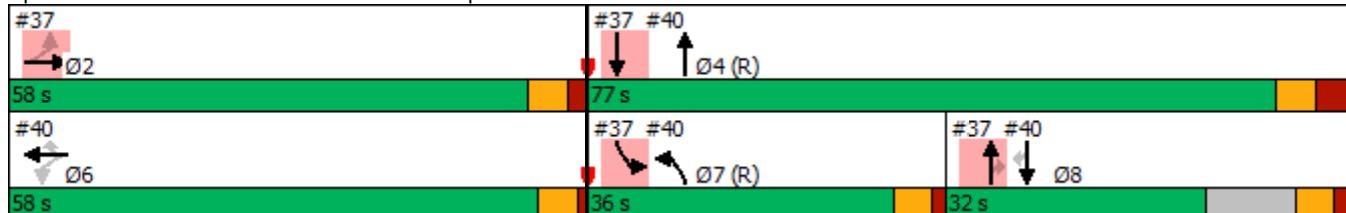
Intersection LOS: D

Intersection Capacity Utilization 73.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 40: SR 101L WB Off Ramp & 75th Ave



Timings

37: 75th Ave & SR 101L EB Off Ramp

04/09/2019



| Lane Group | EBL | EBT | NBT | NBR | SBL | SBT | Ø6 |
|----------------------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations | ↑ ↗ | ↗ ↗ | ↑ ↑ | ↑ ↗ | ↗ ↗ | ↑ ↑ | |
| Traffic Volume (vph) | 478 | 26 | 681 | 435 | 697 | 842 | |
| Future Volume (vph) | 478 | 26 | 681 | 435 | 697 | 842 | |
| Turn Type | Perm | NA | NA | Perm | Prot | NA | |
| Protected Phases | | 2 | 8 | | 7 | 4 | 6 |
| Permitted Phases | 2 | | | 8 | | | |
| Detector Phase | 2 | 2 | 8 | 8 | 7 | 4 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 15.0 | 15.0 | 8.0 | 6.0 | 10.0 |
| Minimum Split (s) | 25.9 | 25.9 | 27.9 | 27.9 | 31.2 | 25.8 | 23.7 |
| Total Split (s) | 58.0 | 58.0 | 32.0 | 32.0 | 36.0 | 77.0 | 58.0 |
| Total Split (%) | 43.0% | 43.0% | 23.7% | 23.7% | 26.7% | 57.0% | 43% |
| Yellow Time (s) | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.3 | 3.9 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.9 | 5.9 | 5.9 | 5.9 | 5.2 | 7.8 | |
| Lead/Lag | | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | | Yes | Yes | Yes | | | |
| Recall Mode | Max | Max | Max | Max | C-Max | C-Max | Max |
| Act Effect Green (s) | 52.1 | 52.1 | 35.1 | 35.1 | 30.8 | 69.2 | |
| Actuated g/C Ratio | 0.39 | 0.39 | 0.26 | 0.26 | 0.23 | 0.51 | |
| v/c Ratio | 0.42 | 0.27 | 0.56 | 0.66 | 0.97 | 0.50 | |
| Control Delay | 33.0 | 27.9 | 45.2 | 11.5 | 94.8 | 18.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 37.7 | 0.6 | |
| Total Delay | 33.0 | 27.9 | 45.2 | 11.5 | 132.5 | 18.6 | |
| LOS | C | C | D | B | F | B | |
| Approach Delay | | 30.1 | 32.1 | | | 70.2 | |
| Approach LOS | | C | C | | | E | |

Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 62 (46%), Referenced to phase 4:SBT and 7:SBL, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 50.1

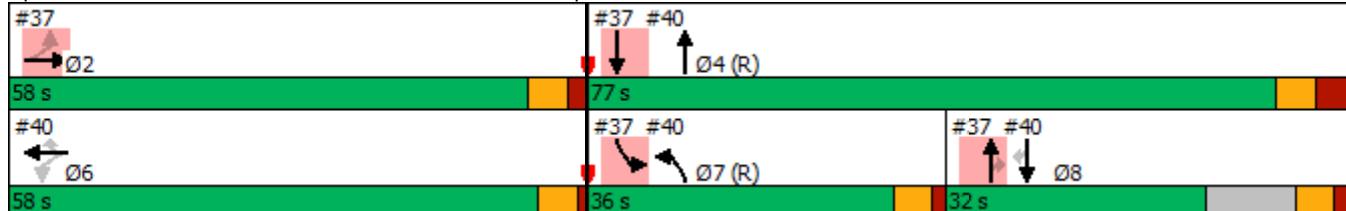
Intersection LOS: D

Intersection Capacity Utilization 73.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 37: 75th Ave & SR 101L EB Off Ramp



Timings

48: SR 101L WB Off Ramp & 67th Ave

04/09/2019



| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR | Ø1 | Ø4 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations | ↑ ↗ | ↑ ↘ | ↑ ↗ | ↑ ↗ | ↑ ↘ | ↑↑↑ | ↑ | | |
| Traffic Volume (vph) | 587 | 473 | 690 | 245 | 1168 | 1035 | 352 | | |
| Future Volume (vph) | 587 | 473 | 690 | 245 | 1168 | 1035 | 352 | | |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm | | |
| Protected Phases | | | | 8 | 5 | 2 | 6 | 1 | 4 |
| Permitted Phases | 8 | | | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 5.0 | 6.0 | 6.0 | 6.0 | 10.0 | 8.0 |
| Minimum Split (s) | 32.3 | 32.3 | 32.3 | 32.0 | 28.0 | 23.9 | 23.9 | 29.9 | 24.4 |
| Total Split (s) | 34.0 | 34.0 | 34.0 | 44.0 | 40.0 | 42.0 | 42.0 | 46.0 | 34.0 |
| Total Split (%) | 28.3% | 28.3% | 28.3% | 36.7% | 33.3% | 35.0% | 35.0% | 38% | 28% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 3.9 | 4.3 | 3.9 | 3.9 | 3.9 | 3.9 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.2 | 1.6 | 3.5 | 3.5 | 2.0 | 3.5 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 5.9 | 5.9 | 5.9 | 5.1 | 5.9 | 7.4 | 7.4 | | |
| Lead/Lag | | | | | Lead | Lag | Lag | Lag | Lead |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | C-Max | Max | Max | Max | C-Max | Max |
| Act Effect Green (s) | 28.1 | 28.1 | 28.1 | 38.9 | 34.1 | 34.6 | 34.6 | | |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.32 | 0.28 | 0.29 | 0.29 | | |
| v/c Ratio | 1.30 | 1.30 | 0.65 | 0.46 | 1.26 | 0.61 | 0.61 | | |
| Control Delay | 192.0 | 181.9 | 8.7 | 45.9 | 158.4 | 38.5 | 17.0 | | |
| Queue Delay | 0.4 | 0.2 | 0.0 | 2.1 | 0.0 | 0.3 | 0.0 | | |
| Total Delay | 192.4 | 182.1 | 8.7 | 48.0 | 158.4 | 38.8 | 17.0 | | |
| LOS | F | F | A | D | F | D | B | | |
| Approach Delay | | 144.5 | | | 139.2 | 33.3 | | | |
| Approach LOS | | F | | | F | C | | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 1:SBL and 5:, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.30

Intersection Signal Delay: 108.9

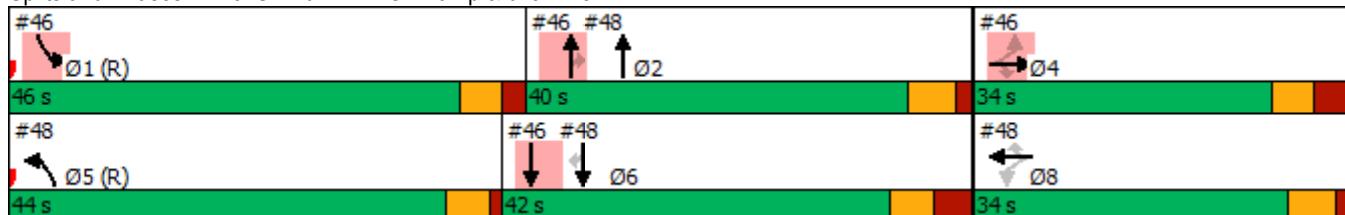
Intersection LOS: F

Intersection Capacity Utilization 95.6%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 48: SR 101L WB Off Ramp & 67th Ave



Timings

46: 67th Ave & SR 101L EB Off Ramp

04/09/2019



| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT | Ø5 | Ø8 |
|----------------------|-------|--------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations | ↑ ↗ | ↔ ↔ | ↗ | ↑ ↑ ↑ | ↗ | ↖ ↗ | ↖ ↗ | | |
| Traffic Volume (vph) | 660 | 173 | 158 | 753 | 358 | 615 | 1007 | | |
| Future Volume (vph) | 660 | 173 | 158 | 753 | 358 | 615 | 1007 | | |
| Turn Type | Perm | NA | Perm | NA | Perm | Prot | NA | | |
| Protected Phases | | | | 4 | 2 | | 1 | 6 | 5 8 |
| Permitted Phases | 4 | | | | 4 | 2 | | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 6.0 | 6.0 | 10.0 | 6.0 | 5.0 | 10.0 |
| Minimum Split (s) | 24.4 | 24.4 | 24.4 | 28.0 | 28.0 | 29.9 | 23.9 | 32.0 | 32.3 |
| Total Split (s) | 34.0 | 34.0 | 34.0 | 40.0 | 40.0 | 46.0 | 42.0 | 44.0 | 34.0 |
| Total Split (%) | 28.3% | 28.3% | 28.3% | 33.3% | 33.3% | 38.3% | 35.0% | 37% | 28% |
| Yellow Time (s) | 3.9 | 3.9 | 3.9 | 4.3 | 4.3 | 3.9 | 3.9 | 3.9 | 4.3 |
| All-Red Time (s) | 3.5 | 3.5 | 3.5 | 1.6 | 1.6 | 2.0 | 3.5 | 1.2 | 1.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 7.4 | 7.4 | 7.4 | 5.9 | 5.9 | 5.9 | 7.4 | | |
| Lead/Lag | | | | Lag | Lag | Lead | Lag | Lag | Lead |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | Max | Max | Max | Max | Max | C-Max | Max | C-Max | None |
| Act Effect Green (s) | 26.6 | 26.6 | 26.6 | 34.1 | 34.1 | 40.1 | 34.6 | | |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | 0.28 | 0.28 | 0.33 | 0.29 | | |
| v/c Ratio | 1.01 | 1.00dl | 0.35 | 0.57 | 0.66 | 0.58 | 1.07 | | |
| Control Delay | 96.1 | 55.4 | 8.3 | 38.5 | 24.6 | 51.8 | 72.7 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 3.2 | 0.0 | | |
| Total Delay | 96.1 | 55.4 | 8.3 | 39.8 | 24.6 | 55.0 | 72.7 | | |
| LOS | F | E | A | D | C | E | E | | |
| Approach Delay | | 62.2 | | 34.9 | | | 66.0 | | |
| Approach LOS | | E | | C | | | E | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 1:SBL and 5:, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.30

Intersection Signal Delay: 55.7

Intersection LOS: E

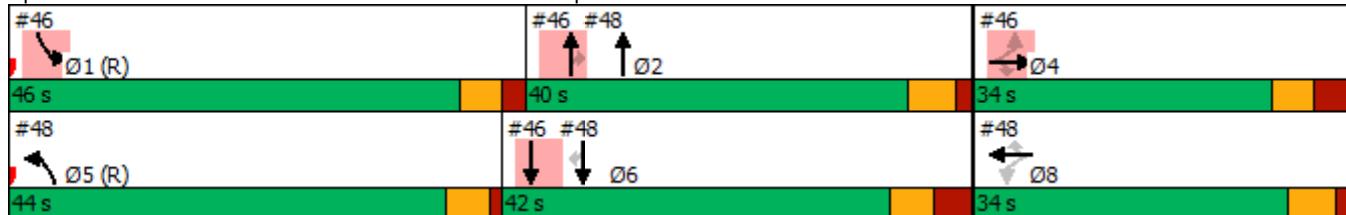
Intersection Capacity Utilization 95.6%

ICU Level of Service F

Analysis Period (min) 15

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 46: 67th Ave & SR 101L EB Off Ramp



Timings

3: Bell Rd & 92nd Ave

02/25/2019



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | ↑↑↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 10 | 1585 | 2086 | 202 | 258 | 16 |
| Future Volume (vph) | 10 | 1585 | 2086 | 202 | 258 | 16 |
| Turn Type | pm+pt | NA | NA | Perm | Perm | Perm |
| Protected Phases | 7 | 4 | 8 | | | |
| Permitted Phases | 4 | | | 8 | 6 | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.8 | 24.1 | 24.1 | 24.1 | 23.6 | 23.6 |
| Total Split (s) | 10.8 | 64.0 | 53.2 | 53.2 | 26.0 | 26.0 |
| Total Split (%) | 12.0% | 71.1% | 59.1% | 59.1% | 28.9% | 28.9% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.5 | 1.5 | 1.5 | 1.5 | 1.3 | 1.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.6 | 5.6 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |
| Act Effect Green (s) | 58.2 | 58.2 | 56.0 | 56.0 | 20.4 | 20.4 |
| Actuated g/C Ratio | 0.65 | 0.65 | 0.62 | 0.62 | 0.23 | 0.23 |
| v/c Ratio | 0.06 | 0.52 | 0.72 | 0.21 | 0.70 | 0.05 |
| Control Delay | 6.4 | 9.2 | 13.9 | 1.9 | 42.6 | 12.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 6.4 | 9.2 | 13.9 | 1.9 | 42.6 | 12.9 |
| LOS | A | A | B | A | D | B |
| Approach Delay | | 9.2 | 12.9 | | 40.9 | |
| Approach LOS | | A | B | | D | |

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 13.3

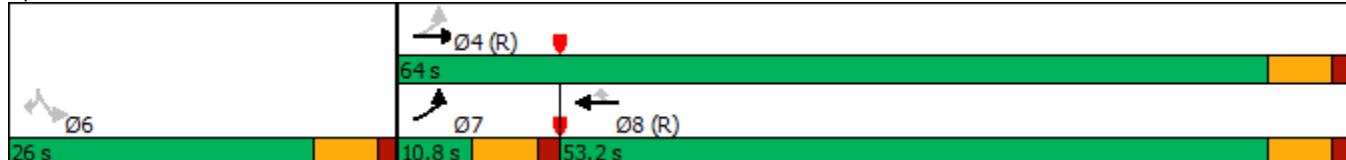
Intersection LOS: B

Intersection Capacity Utilization 64.1%

ICU Level of Service C

Analysis Period (min) 15

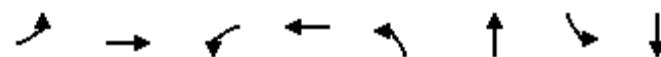
Splits and Phases: 3: Bell Rd & 92nd Ave



Timings

7: Bell Rd & 91st Ave

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↘ | ↑↑↓↓ | ↑ ↘ | ↑↑↓↓ | ↑ ↘ | ↑↓ | ↑ ↘ | ↑↓ |
| Traffic Volume (vph) | 207 | 1630 | 165 | 1935 | 93 | 247 | 198 | 254 |
| Future Volume (vph) | 207 | 1630 | 165 | 1935 | 93 | 247 | 198 | 254 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | 4 | | | 8 | | 2 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.2 | 24.2 | 11.2 | 24.2 | 10.7 | 23.7 | 10.6 | 23.6 |
| Total Split (s) | 18.6 | 60.0 | 19.2 | 60.6 | 11.8 | 23.8 | 17.0 | 29.0 |
| Total Split (%) | 15.5% | 50.0% | 16.0% | 50.5% | 9.8% | 19.8% | 14.2% | 24.2% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.9 | 1.9 | 1.9 | 1.9 | 1.4 | 1.4 | 1.3 | 1.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 | 5.6 | 5.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | None | Max |
| Act Effect Green (s) | 67.5 | 55.2 | 66.1 | 54.4 | 24.2 | 18.1 | 34.8 | 23.4 |
| Actuated g/C Ratio | 0.56 | 0.46 | 0.55 | 0.45 | 0.20 | 0.15 | 0.29 | 0.20 |
| v/c Ratio | 0.93 | 0.79 | 0.76 | 1.00 | 0.50 | 0.74 | 0.90 | 0.61 |
| Control Delay | 73.3 | 30.7 | 47.6 | 51.1 | 42.8 | 47.2 | 73.1 | 39.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 73.3 | 30.7 | 47.6 | 51.1 | 42.8 | 47.2 | 73.1 | 39.0 |
| LOS | E | C | D | D | D | D | E | D |
| Approach Delay | | 35.3 | | 50.8 | | 46.4 | | 50.3 |
| Approach LOS | | D | | D | | D | | D |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 44.7

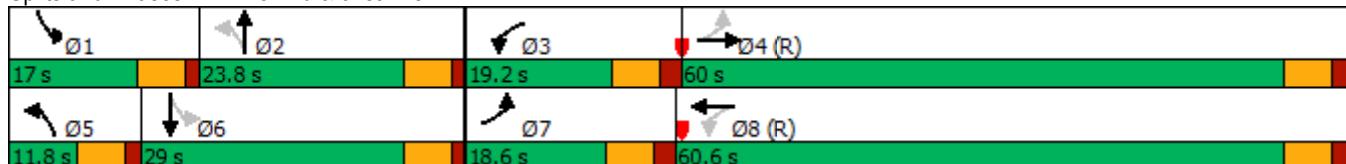
Intersection LOS: D

Intersection Capacity Utilization 94.8%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 7: Bell Rd & 91st Ave



Timings

12: 87th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↓ | ↑ | ↑↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 42 | 1813 | 171 | 2433 | 114 | 78 | 54 | 152 | 105 | 57 | 65 |
| Future Volume (vph) | 42 | 1813 | 171 | 2433 | 114 | 78 | 54 | 152 | 105 | 57 | 65 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | 2 | | 2 | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.3 | 24.3 | 11.3 | 24.3 | 24.3 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 |
| Total Split (s) | 11.3 | 63.7 | 22.6 | 75.0 | 75.0 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 |
| Total Split (%) | 10.3% | 57.9% | 20.5% | 68.2% | 68.2% | 21.5% | 21.5% | 21.5% | 21.5% | 21.5% | 21.5% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 66.7 | 61.7 | 79.7 | 71.0 | 71.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Actuated g/C Ratio | 0.61 | 0.56 | 0.72 | 0.65 | 0.65 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| v/c Ratio | 0.31 | 0.71 | 0.72 | 0.81 | 0.12 | 0.39 | 0.19 | 0.42 | 0.52 | 0.20 | 0.18 |
| Control Delay | 13.8 | 19.7 | 38.5 | 17.6 | 3.2 | 47.1 | 41.7 | 9.8 | 51.6 | 41.9 | 1.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 13.8 | 19.7 | 38.5 | 17.6 | 3.2 | 47.1 | 41.7 | 9.8 | 51.6 | 41.9 | 1.0 |
| LOS | B | B | D | B | A | D | D | A | D | D | A |
| Approach Delay | | 19.6 | | | 18.3 | | | 26.1 | | | 34.6 |
| Approach LOS | | B | | | B | | | C | | | C |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 19.9

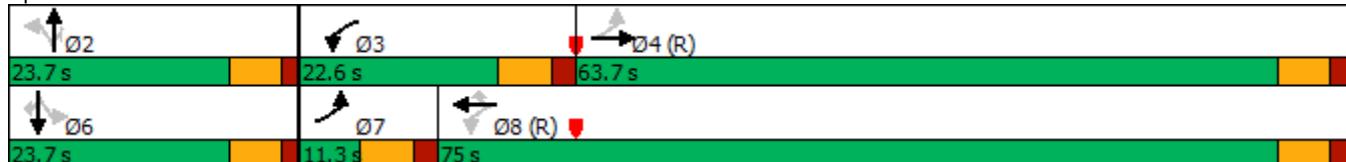
Intersection LOS: B

Intersection Capacity Utilization 78.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 12: 87th Ave & Bell Rd



Timings

17: 84th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|----------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↗ | ↑↑↗ | ↖ | ↑↑↖ | ↗ | ↖ | ↗ | ↖ | ↗ |
| Traffic Volume (vph) | 11 | 2083 | 104 | 2483 | 64 | 47 | 1 | 141 | 1 |
| Future Volume (vph) | 11 | 2083 | 104 | 2483 | 64 | 47 | 1 | 141 | 1 |
| Turn Type | Prot | NA | Prot | NA | Perm | pm+pt | NA | pm+pt | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.7 | 23.7 | 10.7 | 23.7 | 23.7 | 11.5 | 24.5 | 11.5 | 24.5 |
| Total Split (s) | 10.7 | 59.9 | 14.0 | 63.2 | 63.2 | 11.5 | 24.5 | 11.6 | 24.6 |
| Total Split (%) | 9.7% | 54.5% | 12.7% | 57.5% | 57.5% | 10.5% | 22.3% | 10.5% | 22.4% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 2.2 | 2.2 | 2.2 | 2.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lead | Lag | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | C-Max | None | C-Max | C-Max | None | Max | None | Max |
| Act Effect Green (s) | 5.0 | 54.2 | 8.3 | 66.1 | 66.1 | 23.0 | 18.0 | 24.5 | 20.4 |
| Actuated g/C Ratio | 0.05 | 0.49 | 0.08 | 0.60 | 0.60 | 0.21 | 0.16 | 0.22 | 0.19 |
| v/c Ratio | 0.15 | 0.91 | 0.85 | 0.88 | 0.07 | 0.17 | 0.63 | 0.80 | 0.10 |
| Control Delay | 54.8 | 32.5 | 97.1 | 23.9 | 0.1 | 32.1 | 23.3 | 65.6 | 15.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 54.8 | 32.5 | 97.1 | 23.9 | 0.1 | 32.1 | 23.3 | 65.6 | 15.1 |
| LOS | D | C | F | C | A | C | C | E | B |
| Approach Delay | | 32.6 | | 26.2 | | | 24.8 | | 57.1 |
| Approach LOS | | C | | C | | | C | | E |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 29.7

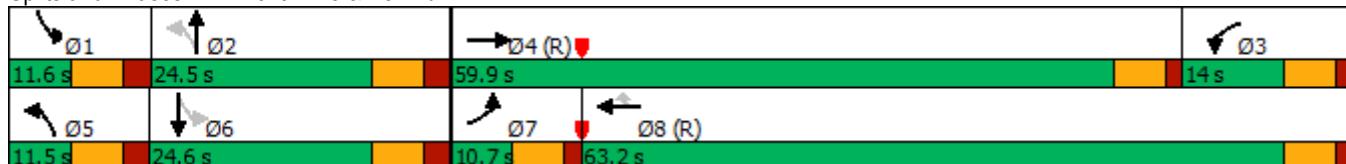
Intersection LOS: C

Intersection Capacity Utilization 94.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 17: 84th Ave & Bell Rd



Timings

11: 83rd Ave & Bell Rd

02/25/2019

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑↑ | ↑↑ | ↑↑↑↑↑ | ↑↑ | ↑↑ | ↑↑ | ↑↑ | ↑↑↑↑↑ | ↑ |
| Traffic Volume (vph) | 404 | 1461 | 236 | 1820 | 440 | 594 | 225 | 200 | 554 | 389 |
| Future Volume (vph) | 404 | 1461 | 236 | 1820 | 440 | 594 | 225 | 200 | 554 | 389 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.9 | 24.9 | 11.9 | 24.9 | 12.2 | 25.2 | 25.2 | 12.1 | 25.1 | 25.1 |
| Total Split (s) | 22.0 | 50.0 | 19.0 | 47.0 | 23.6 | 35.0 | 35.0 | 16.0 | 27.4 | 27.4 |
| Total Split (%) | 18.3% | 41.7% | 15.8% | 39.2% | 19.7% | 29.2% | 29.2% | 13.3% | 22.8% | 22.8% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.6 | 2.6 | 2.6 | 2.6 | 2.9 | 2.9 | 2.9 | 2.8 | 2.8 | 2.8 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 6.9 | 7.2 | 7.2 | 7.2 | 7.1 | 7.1 | 7.1 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |
| Act Effect Green (s) | 15.1 | 43.4 | 11.8 | 40.1 | 16.4 | 27.8 | 27.8 | 8.9 | 20.3 | 20.3 |
| Actuated g/C Ratio | 0.13 | 0.36 | 0.10 | 0.33 | 0.14 | 0.23 | 0.23 | 0.07 | 0.17 | 0.17 |
| v/c Ratio | 1.02 | 0.84 | 0.76 | 1.08 | 1.02 | 0.79 | 0.29 | 0.85 | 0.70 | 0.93 |
| Control Delay | 103.7 | 34.7 | 67.9 | 83.7 | 97.6 | 51.3 | 5.5 | 84.1 | 52.0 | 50.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 103.7 | 34.7 | 67.9 | 83.7 | 97.6 | 51.3 | 5.5 | 84.1 | 52.0 | 50.2 |
| LOS | F | C | E | F | F | D | A | F | D | D |
| Approach Delay | | 47.6 | | | 82.1 | | 59.3 | | 57.0 | |
| Approach LOS | | D | | | F | | E | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 72 (60%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 63.0

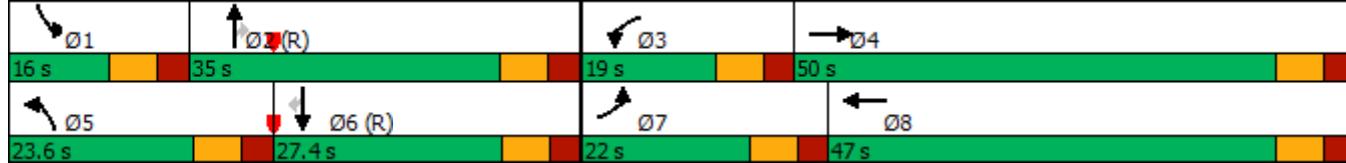
Intersection LOS: E

Intersection Capacity Utilization 89.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 11: 83rd Ave & Bell Rd



Timings

27: 79th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑↑ | ↑ | ↑ | ↑ | ↑ | ↑↑ | ↑ |
| Traffic Volume (vph) | 303 | 1552 | 99 | 1846 | 151 | 74 | 68 | 249 | 71 | 179 |
| Future Volume (vph) | 303 | 1552 | 99 | 1846 | 151 | 74 | 68 | 249 | 71 | 179 |
| Turn Type | Prot | NA | Prot | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 2 | | 2 | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.9 | 24.9 | 11.7 | 24.7 | 11.6 | 24.6 | 24.6 | 11.4 | 24.4 | 24.4 |
| Total Split (s) | 20.0 | 54.4 | 14.0 | 48.4 | 15.4 | 24.6 | 24.6 | 17.0 | 26.2 | 26.2 |
| Total Split (%) | 18.2% | 49.5% | 12.7% | 44.0% | 14.0% | 22.4% | 22.4% | 15.5% | 23.8% | 23.8% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.6 | 2.6 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.1 | 2.1 | 2.1 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.9 | 6.9 | 6.7 | 6.7 | 6.6 | 6.6 | 6.6 | 6.4 | 6.4 | 6.4 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 13.1 | 48.9 | 7.6 | 43.4 | 25.1 | 18.0 | 18.0 | 28.7 | 19.8 | 19.8 |
| Actuated g/C Ratio | 0.12 | 0.44 | 0.07 | 0.39 | 0.23 | 0.16 | 0.16 | 0.26 | 0.18 | 0.18 |
| v/c Ratio | 0.81 | 0.63 | 0.46 | 0.88 | 0.50 | 0.26 | 0.16 | 0.72 | 0.12 | 0.41 |
| Control Delay | 63.3 | 24.8 | 66.2 | 16.3 | 36.7 | 42.9 | 0.8 | 45.9 | 38.5 | 4.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 63.3 | 24.8 | 66.2 | 16.3 | 36.7 | 42.9 | 0.8 | 45.9 | 38.5 | 4.9 |
| LOS | E | C | E | B | D | D | A | D | D | A |
| Approach Delay | | 30.8 | | | 18.6 | | 29.9 | | | 30.1 |
| Approach LOS | | C | | B | | C | | | | C |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 50 (45%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 25.3

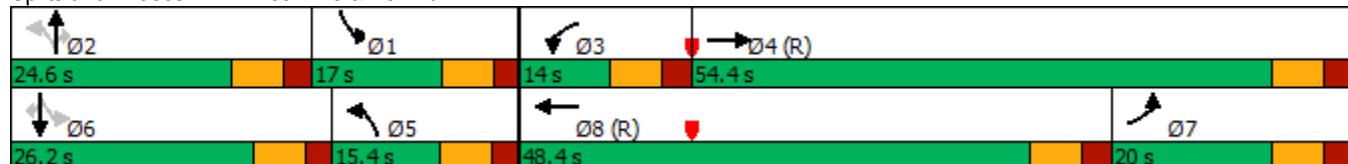
Intersection LOS: C

Intersection Capacity Utilization 75.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 27: 79th Ave & Bell Rd



Timings

32: 77th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑ | ↑↑ | ↑↑ | ↑↑ |
| Traffic Volume (vph) | 193 | 1568 | 175 | 1734 | 196 | 83 | 153 | 79 | 197 |
| Future Volume (vph) | 193 | 1568 | 175 | 1734 | 196 | 83 | 153 | 79 | 197 |
| Turn Type | Prot | NA | Prot | NA | pm+pt | NA | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | 2 | | 6 | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.7 | 24.7 | 11.6 | 24.6 | 11.6 | 24.6 | 11.6 | 24.6 | 24.6 |
| Total Split (s) | 17.0 | 49.2 | 18.0 | 50.2 | 18.0 | 25.5 | 17.3 | 24.8 | 24.8 |
| Total Split (%) | 15.5% | 44.7% | 16.4% | 45.6% | 16.4% | 23.2% | 15.7% | 22.5% | 22.5% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.7 | 6.7 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 |
| Lead/Lag | Lead | Lead | Lag | Lag | Lag | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | None | Max | Max |
| Act Effect Green (s) | 11.1 | 46.3 | 11.4 | 46.6 | 26.5 | 18.9 | 25.1 | 18.2 | 18.2 |
| Actuated g/C Ratio | 0.10 | 0.42 | 0.10 | 0.42 | 0.24 | 0.17 | 0.23 | 0.17 | 0.17 |
| v/c Ratio | 0.61 | 0.67 | 0.54 | 0.76 | 0.62 | 0.31 | 0.55 | 0.28 | 0.47 |
| Control Delay | 37.0 | 19.2 | 52.8 | 29.4 | 41.5 | 19.6 | 39.7 | 43.0 | 7.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 37.0 | 19.2 | 52.8 | 29.4 | 41.5 | 19.6 | 39.7 | 43.0 | 7.6 |
| LOS | D | B | D | C | D | B | D | D | A |
| Approach Delay | | 21.0 | | 31.4 | | 30.9 | | 25.6 | |
| Approach LOS | | C | | C | | C | | C | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 4 (4%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 26.8

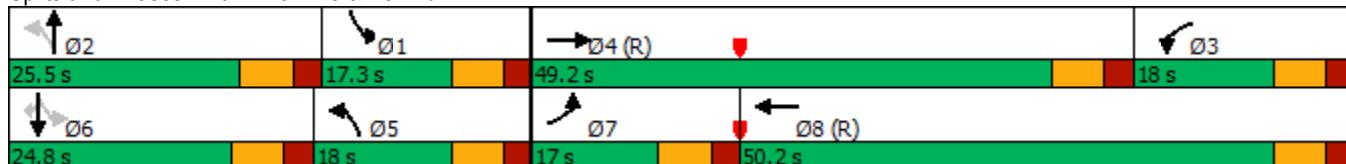
Intersection LOS: C

Intersection Capacity Utilization 70.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 32: 77th Ave & Bell Rd



Timings

37: 75th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑↑ | ↑↑↑↑ | ↑ |
| Traffic Volume (vph) | 254 | 1359 | 410 | 2111 | 294 | 202 | 532 | 162 | 271 | 670 | 118 |
| Future Volume (vph) | 254 | 1359 | 410 | 2111 | 294 | 202 | 532 | 162 | 271 | 670 | 118 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 12.3 | 25.3 | 12.2 | 25.2 | 25.2 | 11.4 | 24.4 | 24.4 | 11.3 | 24.3 | 24.3 |
| Total Split (s) | 17.0 | 52.0 | 26.4 | 61.4 | 61.4 | 15.1 | 25.0 | 25.0 | 16.6 | 26.5 | 26.5 |
| Total Split (%) | 14.2% | 43.3% | 22.0% | 51.2% | 51.2% | 12.6% | 20.8% | 20.8% | 13.8% | 22.1% | 22.1% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 3.0 | 3.0 | 2.9 | 2.9 | 2.9 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.3 | 7.3 | 7.2 | 7.2 | 7.2 | 6.4 | 6.4 | 6.4 | 6.3 | 6.3 | 6.3 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 9.7 | 45.4 | 18.5 | 54.2 | 54.2 | 8.7 | 18.6 | 18.6 | 10.3 | 20.2 | 20.2 |
| Actuated g/C Ratio | 0.08 | 0.38 | 0.15 | 0.45 | 0.45 | 0.07 | 0.16 | 0.16 | 0.09 | 0.17 | 0.17 |
| v/c Ratio | 1.00 | 0.72 | 0.84 | 1.00 | 0.39 | 0.89 | 1.05 | 0.40 | 1.00 | 0.85 | 0.28 |
| Control Delay | 108.5 | 33.3 | 64.5 | 51.8 | 8.5 | 89.6 | 102.3 | 4.8 | 108.2 | 59.1 | 1.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 108.5 | 33.3 | 64.5 | 51.8 | 8.5 | 89.6 | 102.3 | 4.8 | 108.2 | 59.1 | 1.5 |
| LOS | F | C | E | D | A | F | F | A | F | E | A |
| Approach Delay | | 43.7 | | 49.1 | | | 81.8 | | | 65.3 | |
| Approach LOS | | D | | D | | | F | | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 54.6

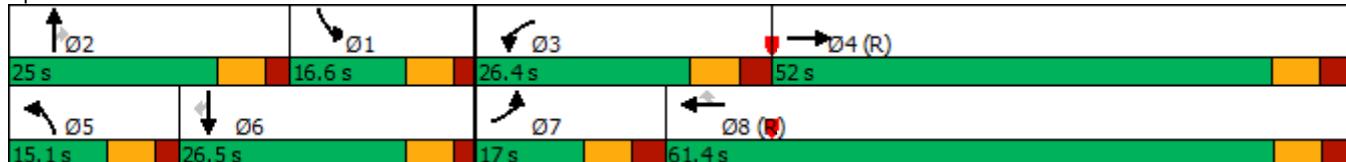
Intersection LOS: D

Intersection Capacity Utilization 93.1%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 37: 75th Ave & Bell Rd



Timings

42: 73rd Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
|----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ | ↑ ↗ ↘ ↖ ↙ ↛ ↕ ↖ ↙ ↛ ↘ ↗ |
| Traffic Volume (vph) | 27 | 1746 | 172 | 2608 | 210 | 22 | 2 | 119 | 188 | 2 | 35 | |
| Future Volume (vph) | 27 | 1746 | 172 | 2608 | 210 | 22 | 2 | 119 | 188 | 2 | 35 | |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | Perm | |
| Protected Phases | 7 | 4 | 3 | 8 | | | 2 | | | 6 | | |
| Permitted Phases | | | | 8 | 2 | | 2 | 6 | | 6 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 11.3 | 24.3 | 11.3 | 24.3 | 24.3 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | |
| Total Split (s) | 11.3 | 62.0 | 23.0 | 73.7 | 73.7 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Total Split (%) | 10.3% | 56.4% | 20.9% | 67.0% | 67.0% | 22.7% | 22.7% | 22.7% | 22.7% | 22.7% | 22.7% | |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | C-Max | Max | Max | Max | Max | Max | Max | |
| Act Effect Green (s) | 65.3 | 60.3 | 78.7 | 71.9 | 71.9 | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | |
| Actuated g/C Ratio | 0.59 | 0.55 | 0.72 | 0.65 | 0.65 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | |
| v/c Ratio | 0.20 | 0.69 | 0.71 | 0.85 | 0.21 | 0.10 | 0.01 | 0.33 | 0.87 | 0.01 | 0.10 | |
| Control Delay | 9.8 | 20.2 | 38.1 | 19.4 | 4.3 | 40.2 | 38.5 | 5.8 | 78.4 | 38.5 | 0.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 9.8 | 20.2 | 38.1 | 19.4 | 4.3 | 40.2 | 38.5 | 5.8 | 78.4 | 38.5 | 0.5 | |
| LOS | A | C | D | B | A | D | D | A | E | D | A | |
| Approach Delay | | 20.1 | | 19.4 | | | 11.6 | | | 65.9 | | |
| Approach LOS | | C | | B | | | B | | | E | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 21.4

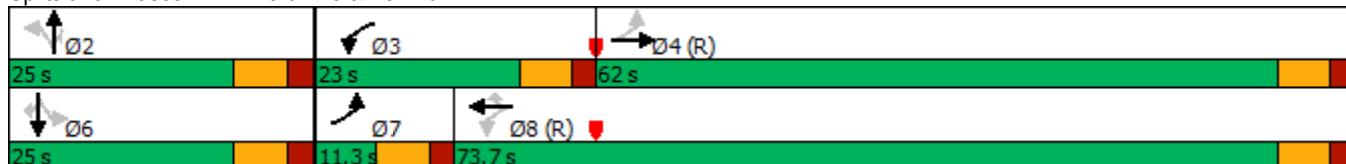
Intersection LOS: C

Intersection Capacity Utilization 87.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 42: 73rd Ave & Bell Rd



Timings

47: 69th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | | ↑ | ↑↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 24 | 2012 | 16 | 107 | 2940 | 17 | 1 | 85 | 147 | 1 | 32 |
| Future Volume (vph) | 24 | 2012 | 16 | 107 | 2940 | 17 | 1 | 85 | 147 | 1 | 32 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | 8 | | 2 | | 2 | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.9 | 23.9 | 23.9 | 10.9 | 23.9 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 |
| Total Split (s) | 11.0 | 77.6 | 77.6 | 18.0 | 84.6 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 |
| Total Split (%) | 9.2% | 64.7% | 64.7% | 15.0% | 70.5% | 20.3% | 20.3% | 20.3% | 20.3% | 20.3% | 20.3% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 74.9 | 74.9 | 74.9 | 83.1 | 83.1 | 18.1 | 18.1 | 18.1 | 18.1 | 18.1 | 18.1 |
| Actuated g/C Ratio | 0.62 | 0.62 | 0.62 | 0.69 | 0.69 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| v/c Ratio | 0.19 | 0.69 | 0.02 | 0.59 | 0.96 | 0.08 | 0.00 | 0.26 | 0.75 | 0.00 | 0.10 |
| Control Delay | 21.0 | 16.6 | 0.0 | 30.8 | 27.3 | 45.1 | 43.0 | 4.2 | 71.5 | 43.0 | 0.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 21.0 | 16.6 | 0.0 | 30.8 | 27.3 | 45.1 | 43.0 | 4.2 | 71.5 | 43.0 | 0.6 |
| LOS | C | B | A | C | C | D | D | A | E | D | A |
| Approach Delay | | 16.5 | | | 27.5 | | 11.2 | | | 58.7 | |
| Approach LOS | | B | | | C | | B | | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 24.1

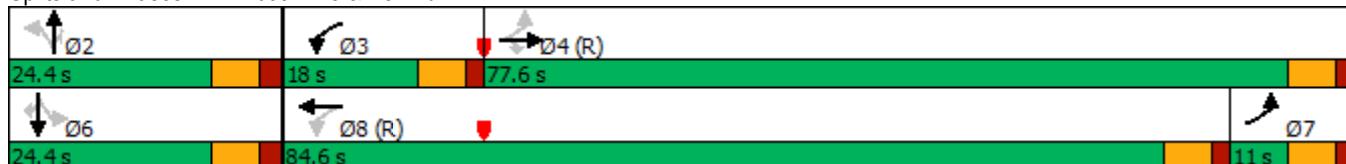
Intersection LOS: C

Intersection Capacity Utilization 94.5%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 47: 69th Ave & Bell Rd



Timings

52: 67th Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | ↑ | ↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑↑ | ↑↑↑ | ↑ |
| Traffic Volume (vph) | 226 | 1717 | 359 | 184 | 2538 | 248 | 569 | 789 | 188 | 248 | 775 | 209 |
| Future Volume (vph) | 226 | 1717 | 359 | 184 | 2538 | 248 | 569 | 789 | 188 | 248 | 775 | 209 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | 8 | | 8 | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 12.0 | 25.0 | 25.0 | 12.0 | 25.0 | 25.0 | 11.1 | 24.1 | 24.1 | 10.9 | 23.9 | 23.9 |
| Total Split (s) | 14.0 | 57.0 | 57.0 | 16.0 | 59.0 | 59.0 | 23.0 | 33.0 | 33.0 | 14.0 | 24.0 | 24.0 |
| Total Split (%) | 11.7% | 47.5% | 47.5% | 13.3% | 49.2% | 49.2% | 19.2% | 27.5% | 27.5% | 11.7% | 20.0% | 20.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 1.8 | 1.8 | 1.8 | 1.6 | 1.6 | 1.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 6.1 | 6.1 | 6.1 | 5.9 | 5.9 | 5.9 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 50.0 | 50.0 | 50.0 | 52.0 | 52.0 | 52.0 | 16.9 | 26.9 | 26.9 | 8.1 | 18.1 | 18.1 |
| Actuated g/C Ratio | 0.42 | 0.42 | 0.42 | 0.43 | 0.43 | 0.43 | 0.14 | 0.22 | 0.22 | 0.07 | 0.15 | 0.15 |
| v/c Ratio | 1.49 | 0.88 | 0.46 | 1.03 | 1.25 | 0.34 | 1.28 | 1.08 | 0.39 | 1.17 | 1.10 | 0.48 |
| Control Delay | 284.6 | 38.3 | 6.7 | 101.8 | 148.8 | 7.3 | 182.7 | 100.5 | 6.3 | 160.8 | 110.2 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 284.6 | 38.3 | 6.7 | 101.8 | 148.8 | 7.3 | 182.7 | 100.5 | 6.3 | 160.8 | 110.2 | 5.8 |
| LOS | F | D | A | F | F | A | F | F | A | F | F | A |
| Approach Delay | | 57.6 | | | 134.1 | | | | 119.3 | | | 102.7 |
| Approach LOS | | E | | | F | | | | F | | | F |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.49

Intersection Signal Delay: 104.6

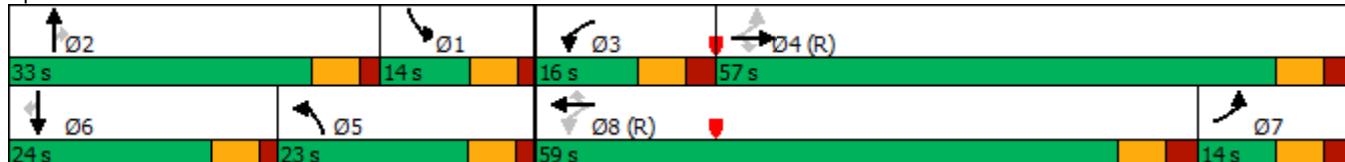
Intersection LOS: F

Intersection Capacity Utilization 114.4%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 52: 67th Ave & Bell Rd



Timings

57: 63rd Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ |
| Traffic Volume (vph) | 220 | 1537 | 214 | 2167 | 228 | 14 | 104 | 215 | 48 | 484 |
| Future Volume (vph) | 220 | 1537 | 214 | 2167 | 228 | 14 | 104 | 215 | 48 | 484 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.8 | 23.8 | 10.8 | 23.8 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 |
| Total Split (s) | 18.0 | 57.2 | 21.2 | 60.4 | 31.6 | 31.6 | 31.6 | 31.6 | 31.6 | 31.6 |
| Total Split (%) | 16.4% | 52.0% | 19.3% | 54.9% | 28.7% | 28.7% | 28.7% | 28.7% | 28.7% | 28.7% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.5 | 1.5 | 1.5 | 1.5 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 |
| Lead/Lag | Lead | Lag | Lead | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 65.1 | 53.1 | 68.5 | 54.8 | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 | 25.4 |
| Actuated g/C Ratio | 0.59 | 0.48 | 0.62 | 0.50 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| v/c Ratio | 0.92 | 0.85 | 0.81 | 0.99 | 0.80 | 0.03 | 0.25 | 0.73 | 0.12 | 1.00 |
| Control Delay | 68.4 | 28.7 | 47.7 | 44.4 | 59.9 | 33.2 | 7.9 | 53.8 | 34.5 | 65.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 68.4 | 28.7 | 47.7 | 44.4 | 59.9 | 33.2 | 7.9 | 53.8 | 34.5 | 65.1 |
| LOS | E | C | D | D | E | C | A | D | C | E |
| Approach Delay | | 32.8 | | 44.7 | | 43.2 | | | 59.9 | |
| Approach LOS | | C | | D | | D | | | E | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 42.2

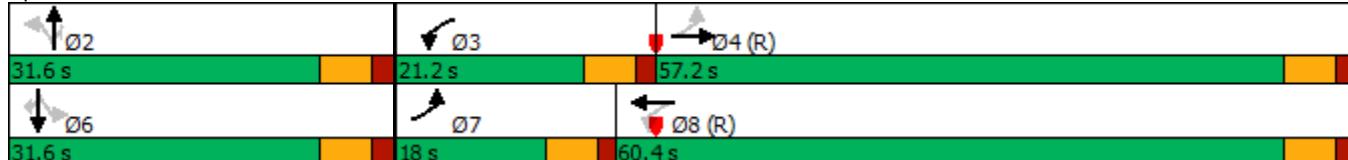
Intersection LOS: D

Intersection Capacity Utilization 102.7%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 57: 63rd Ave & Bell Rd



Timings

62: 59th Ave & Bell Rd

02/25/2019

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | ↑ | ↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑ | ↑↑↑ | ↑ |
| Traffic Volume (vph) | 240 | 1097 | 224 | 196 | 1492 | 220 | 416 | 803 | 202 | 188 | 620 | 207 |
| Future Volume (vph) | 240 | 1097 | 224 | 196 | 1492 | 220 | 416 | 803 | 202 | 188 | 620 | 207 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | 8 | | 8 | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.4 | 24.4 | 24.4 | 11.6 | 24.6 | 24.6 | 10.9 | 23.9 | 23.9 | 11.0 | 24.0 | 24.0 |
| Total Split (s) | 19.6 | 43.9 | 43.9 | 21.0 | 45.3 | 45.3 | 22.7 | 35.1 | 35.1 | 20.0 | 32.4 | 32.4 |
| Total Split (%) | 16.3% | 36.6% | 36.6% | 17.5% | 37.8% | 37.8% | 18.9% | 29.3% | 29.3% | 16.7% | 27.0% | 27.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.3 | 2.3 | 2.3 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.4 | 6.4 | 6.4 | 6.6 | 6.6 | 6.6 | 5.9 | 5.9 | 5.9 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 51.7 | 38.5 | 38.5 | 52.1 | 38.7 | 38.7 | 16.8 | 29.2 | 29.2 | 14.0 | 26.4 | 26.4 |
| Actuated g/C Ratio | 0.43 | 0.32 | 0.32 | 0.43 | 0.32 | 0.32 | 0.14 | 0.24 | 0.24 | 0.12 | 0.22 | 0.22 |
| v/c Ratio | 1.02 | 0.73 | 0.38 | 0.82 | 0.99 | 0.37 | 0.94 | 1.01 | 0.42 | 0.99 | 0.87 | 0.49 |
| Control Delay | 93.8 | 39.5 | 9.5 | 51.0 | 60.5 | 8.7 | 80.2 | 79.3 | 10.9 | 113.6 | 57.9 | 18.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 93.8 | 39.5 | 9.5 | 51.0 | 60.5 | 8.7 | 80.2 | 79.3 | 10.9 | 113.6 | 57.9 | 18.9 |
| LOS | F | D | A | D | E | A | F | E | B | F | E | B |
| Approach Delay | | 43.6 | | | 53.6 | | | 69.8 | | | 60.2 | |
| Approach LOS | | D | | | D | | | E | | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 56.0

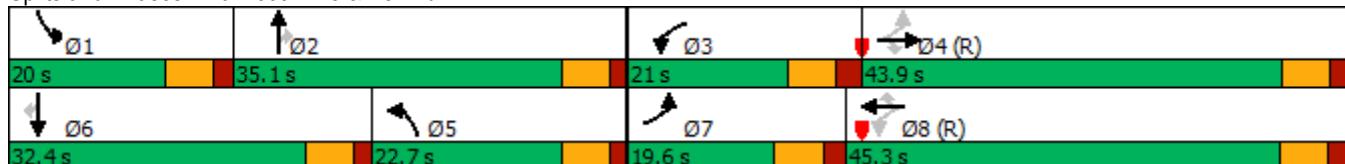
Intersection LOS: E

Intersection Capacity Utilization 95.5%

ICU Level of Service F

Analysis Period (min) 15

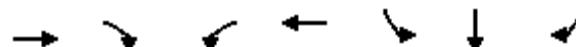
Splits and Phases: 62: 59th Ave & Bell Rd



Timings

4: Thunderbird Rd & SR 101L SB Off Ramp

04/10/2019



| Lane Group | EBT | EBR | WBL | WBT | SBL | SBT | SBR | Ø2 | Ø7 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | | ↑ | ↑ | ↑↑↑ | ↑ | ↔ | ↑ | ↑ | |
| Traffic Volume (vph) | 1140 | 510 | 560 | 1410 | 290 | 0 | 710 | | |
| Future Volume (vph) | 1140 | 510 | 560 | 1410 | 290 | 0 | 710 | | |
| Turn Type | NA | Perm | Prot | NA | Perm | NA | Perm | | |
| Protected Phases | 4 | | | 3 | 8 | | 6 | 2 | 7 |
| Permitted Phases | | | | 4 | | 6 | | 6 | |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 | 6 | 6 | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.6 | 24.6 | 11.0 | 24.0 | 25.3 | 25.3 | 25.3 | 25.3 | 10.9 |
| Total Split (s) | 31.7 | 31.7 | 25.0 | 38.2 | 53.3 | 53.3 | 53.3 | 53.3 | 18.5 |
| Total Split (%) | 28.8% | 28.8% | 22.7% | 34.7% | 48.5% | 48.5% | 48.5% | 48% | 17% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.3 | 2.3 | 1.7 | 1.7 | 3.0 | 3.0 | 3.0 | 3.0 | 1.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.6 | 6.6 | 6.0 | 6.0 | 7.3 | 7.3 | 7.3 | | |
| Lead/Lag | Lag | Lag | Lead | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | Max | Max |
| Act Effect Green (s) | 25.1 | 25.1 | 19.0 | 32.2 | 46.0 | 46.0 | 46.0 | | |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.17 | 0.29 | 0.42 | 0.42 | 0.42 | | |
| v/c Ratio | 0.72 | 0.70 | 1.05 | 1.03 | 0.40 | 0.49 | 0.48 | | |
| Control Delay | 42.0 | 8.6 | 93.0 | 63.4 | 24.5 | 5.7 | 5.5 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 42.0 | 8.6 | 93.0 | 63.4 | 24.5 | 5.7 | 5.5 | | |
| LOS | D | A | F | E | C | A | A | | |
| Approach Delay | 31.7 | | | 71.8 | | 10.5 | | | |
| Approach LOS | C | | | E | | B | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 44.2

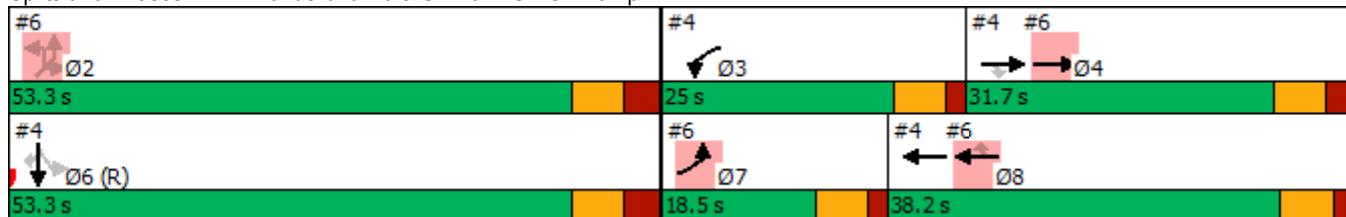
Intersection LOS: D

Intersection Capacity Utilization 79.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Thunderbird Rd & SR 101L SB Off Ramp



Timings

6: SR 101L NB Off Ramp & Thunderbird Rd

04/10/2019



| Lane Group | EBL | EBT | WBT | WBR | NEL2 | NEL | NER | Ø3 | Ø6 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑↑↑↑ | ↑ | ↑ | ↑↑ | ↑ | | |
| Traffic Volume (vph) | 350 | 1080 | 1270 | 350 | 700 | 0 | 1130 | | |
| Future Volume (vph) | 350 | 1080 | 1270 | 350 | 700 | 0 | 1130 | | |
| Turn Type | Prot | NA | NA | Perm | Perm | Perm | Perm | | |
| Protected Phases | 7 | 4 | 8 | | | | | 3 | 6 |
| Permitted Phases | | | | 8 | 2 | 2 | 2 | | |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 | 2 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.9 | 24.6 | 24.0 | 24.0 | 25.3 | 25.3 | 25.3 | 11.0 | 25.3 |
| Total Split (s) | 18.5 | 31.7 | 38.2 | 38.2 | 53.3 | 53.3 | 53.3 | 25.0 | 53.3 |
| Total Split (%) | 16.8% | 28.8% | 34.7% | 34.7% | 48.5% | 48.5% | 48.5% | 23% | 48% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.6 | 2.3 | 1.7 | 1.7 | 3.0 | 3.0 | 3.0 | 1.7 | 3.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 5.9 | 6.6 | 6.0 | 6.0 | 7.3 | 7.3 | 7.3 | | |
| Lead/Lag | Lead | Lag | Lag | Lag | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | Max | None | None | None | Max | Max | Max | None | C-Max |
| Act Effect Green (s) | 12.6 | 25.1 | 32.2 | 32.2 | 46.0 | 46.0 | 46.0 | | |
| Actuated g/C Ratio | 0.11 | 0.23 | 0.29 | 0.29 | 0.42 | 0.42 | 0.42 | | |
| v/c Ratio | 0.96 | 1.00 | 0.63 | 0.52 | 1.03 | 0.70 | 0.72 | | |
| Control Delay | 84.5 | 85.7 | 35.3 | 5.9 | 73.1 | 14.4 | 15.4 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 84.5 | 85.7 | 35.3 | 5.9 | 73.1 | 14.4 | 15.4 | | |
| LOS | F | F | D | A | E | B | B | | |
| Approach Delay | | 85.4 | 29.0 | | | 37.2 | | | |
| Approach LOS | | F | C | | | D | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 48.6

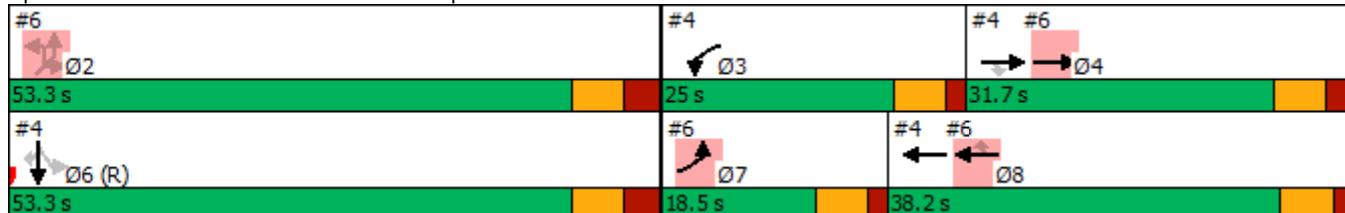
Intersection LOS: D

Intersection Capacity Utilization 79.4%

ICU Level of Service D

Analysis Period (min) 15

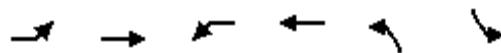
Splits and Phases: 6: SR 101L NB Off Ramp & Thunderbird Rd



Timings

16: SR 101L & Bell Rd

04/10/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | SBL |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑ | ↑↑ | ↑↑↑ | ↑↑ | ↑↑ |
| Traffic Volume (vph) | 890 | 1290 | 290 | 670 | 660 | 270 |
| Future Volume (vph) | 890 | 1290 | 290 | 670 | 660 | 270 |
| Turn Type | Prot | NA | Prot | NA | Prot | Prot |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 1 |
| Permitted Phases | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 1 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 13.0 | 26.0 | 13.1 | 26.1 | 12.3 | 12.1 |
| Total Split (s) | 49.0 | 53.4 | 25.6 | 30.0 | 41.0 | 41.0 |
| Total Split (%) | 40.8% | 44.5% | 21.3% | 25.0% | 34.2% | 34.2% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 3.7 | 3.7 | 3.8 | 3.8 | 3.0 | 2.8 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 8.0 | 8.0 | 8.1 | 8.1 | 7.3 | 7.1 |
| Lead/Lag | Lead | Lag | Lead | Lag | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None |
| Act Effect Green (s) | 38.0 | 44.2 | 15.5 | 21.7 | 36.9 | 37.1 |
| Actuated g/C Ratio | 0.32 | 0.37 | 0.13 | 0.18 | 0.31 | 0.31 |
| v/c Ratio | 0.88 | 0.74 | 0.71 | 0.79 | 0.70 | 0.27 |
| Control Delay | 49.1 | 35.6 | 45.7 | 47.7 | 41.9 | 33.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 49.1 | 35.6 | 45.7 | 47.7 | 41.9 | 33.1 |
| LOS | D | D | D | D | D | C |
| Approach Delay | | 41.1 | | 47.1 | | |
| Approach LOS | | D | | D | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 42.1

Intersection LOS: D

Intersection Capacity Utilization 76.7%

ICU Level of Service D

Analysis Period (min) 15

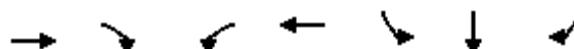
Splits and Phases: 16: SR 101L & Bell Rd



Timings

30: Union Hills Dr & SR 101L SB Off Ramp

04/10/2019



| Lane Group | EBT | EBR | WBL | WBT | SBL | SBT | SBR | Ø2 | Ø7 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations | | ↑ | ↑↓ | ↑↑↑ | ↑ | ↑↓ | ↑↑ | | |
| Traffic Volume (vph) | 1300 | 330 | 170 | 1020 | 310 | 17 | 420 | | |
| Future Volume (vph) | 1300 | 330 | 170 | 1020 | 310 | 17 | 420 | | |
| Turn Type | NA | Perm | Prot | NA | Perm | NA | Perm | | |
| Protected Phases | 4 | | | 3 | 8 | | 6 | 2 | 7 |
| Permitted Phases | | | | | | 6 | | 6 | |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 11.0 | 24.0 | 25.2 | 25.2 | 25.2 | 25.2 | 11.0 |
| Total Split (s) | 49.0 | 49.0 | 17.0 | 35.0 | 44.0 | 44.0 | 44.0 | 44.0 | 31.0 |
| Total Split (%) | 44.5% | 44.5% | 15.5% | 31.8% | 40.0% | 40.0% | 40.0% | 40% | 28% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.7 | 1.7 | 1.7 | 1.7 | 2.9 | 2.9 | 2.9 | 2.9 | 1.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 7.2 | 7.2 | 7.2 | | |
| Lead/Lag | Lag | Lag | Lead | Lead | | | | Lag | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | C-Max | None |
| Act Effect Green (s) | 43.8 | 43.8 | 10.2 | 29.0 | 36.8 | 36.8 | 36.8 | | |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.09 | 0.26 | 0.33 | 0.33 | 0.33 | | |
| v/c Ratio | 0.47 | 0.43 | 0.59 | 0.84 | 0.32 | 0.32 | 0.38 | | |
| Control Delay | 25.2 | 4.1 | 57.5 | 27.4 | 29.2 | 29.4 | 3.4 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 25.2 | 4.1 | 57.5 | 27.8 | 29.2 | 29.4 | 3.4 | | |
| LOS | C | A | E | C | C | C | A | | |
| Approach Delay | 20.9 | | | 32.1 | | 14.7 | | | |
| Approach LOS | C | | | C | | B | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 23.4

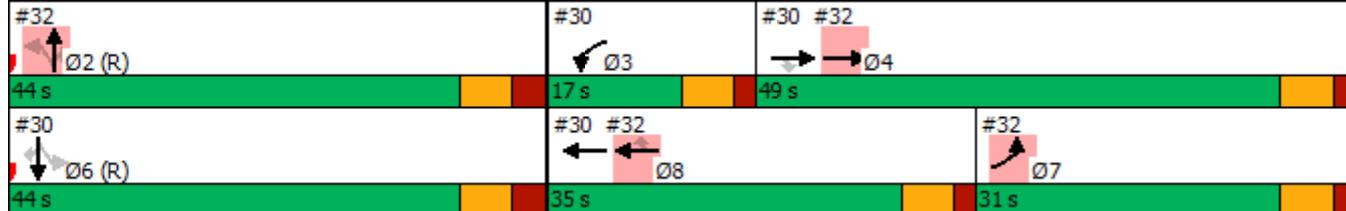
Intersection LOS: C

Intersection Capacity Utilization 57.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 30: Union Hills Dr & SR 101L SB Off Ramp



Timings

32: SR 101L NB Off Ramp & Union Hills Dr

04/10/2019



| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | NBR | Ø3 | Ø6 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑↑↑↑ | ↑ | ↑ | ↑↑ | ↑ | | |
| Traffic Volume (vph) | 540 | 1070 | 550 | 140 | 640 | 0 | 360 | | |
| Future Volume (vph) | 540 | 1070 | 550 | 140 | 640 | 0 | 360 | | |
| Turn Type | Prot | NA | NA | Perm | Perm | NA | Perm | | |
| Protected Phases | 7 | 4 | 8 | | | 2 | | 3 | 6 |
| Permitted Phases | | | | 8 | 2 | | 2 | | |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 | 2 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.0 | 24.0 | 24.0 | 24.0 | 25.2 | 25.2 | 25.2 | 11.0 | 25.2 |
| Total Split (s) | 31.0 | 49.0 | 35.0 | 35.0 | 44.0 | 44.0 | 44.0 | 17.0 | 44.0 |
| Total Split (%) | 28.2% | 44.5% | 31.8% | 31.8% | 40.0% | 40.0% | 40.0% | 15% | 40% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.7 | 1.7 | 1.7 | 1.7 | 2.9 | 2.9 | 2.9 | 1.7 | 2.9 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 7.2 | 7.2 | 7.2 | | |
| Lead/Lag | Lag | Lag | Lead | Lead | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | None | C-Max |
| Act Effect Green (s) | 25.0 | 43.8 | 29.0 | 29.0 | 36.8 | 36.8 | 36.8 | | |
| Actuated g/C Ratio | 0.23 | 0.40 | 0.26 | 0.26 | 0.33 | 0.33 | 0.33 | | |
| v/c Ratio | 0.75 | 0.57 | 0.30 | 0.28 | 0.64 | 0.64 | 0.55 | | |
| Control Delay | 31.6 | 14.2 | 32.9 | 6.6 | 37.6 | 37.6 | 12.7 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 31.6 | 14.2 | 32.9 | 6.6 | 37.6 | 37.6 | 12.7 | | |
| LOS | C | B | C | A | D | D | B | | |
| Approach Delay | 20.0 | 27.6 | | | 28.6 | | | | |
| Approach LOS | C | C | | C | | | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 24.2

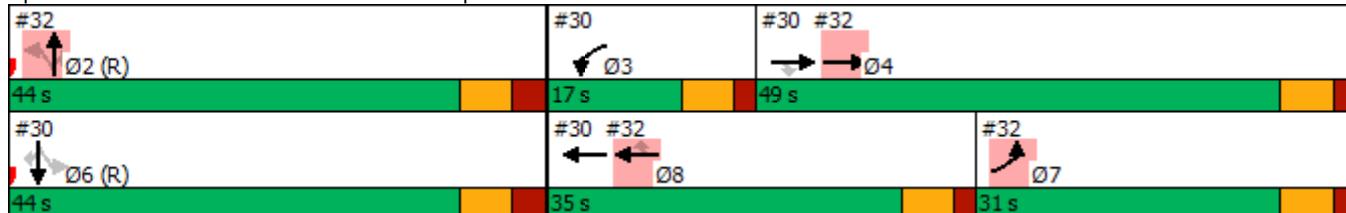
Intersection LOS: C

Intersection Capacity Utilization 57.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 32: SR 101L NB Off Ramp & Union Hills Dr



Timings

40: SR 101L WB Off Ramp & 75th Ave

04/10/2019



| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR | Ø1 | Ø4 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑ | ↔↔ | ↑ | ↑ | ↑↑ | ↑↑↑ | ↑ | | |
| Traffic Volume (vph) | 380 | 43 | 580 | 120 | 590 | 1520 | 340 | | |
| Future Volume (vph) | 380 | 43 | 580 | 120 | 590 | 1520 | 340 | | |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm | | |
| Protected Phases | | | | 8 | 5 | 2 | 6 | 1 | 4 |
| Permitted Phases | 8 | | | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.6 | 24.6 | 24.6 | 11.3 | 24.3 | 23.7 | 23.7 | 11.1 | 24.4 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 21.9 | 31.0 | 61.1 | 61.1 | 52.0 | 27.0 |
| Total Split (%) | 24.5% | 24.5% | 24.5% | 19.9% | 28.2% | 55.5% | 55.5% | 47% | 25% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.3 | 2.3 | 2.3 | 2.0 | 2.0 | 1.4 | 1.4 | 1.8 | 2.1 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.6 | 6.6 | 6.6 | 6.3 | 6.3 | 5.7 | 5.7 | | |
| Lead/Lag | | | | Lead | Lead | Lag | Lag | Lag | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | None | None |
| Act Effect Green (s) | 20.3 | 20.3 | 20.3 | 12.8 | 24.8 | 58.4 | 58.4 | | |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.18 | 0.12 | 0.23 | 0.53 | 0.53 | | |
| v/c Ratio | 0.91 | 0.65 | 0.60 | 0.63 | 0.80 | 0.49 | 0.37 | | |
| Control Delay | 77.7 | 19.5 | 9.8 | 48.8 | 20.9 | 17.3 | 2.6 | | |
| Queue Delay | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | | |
| Total Delay | 77.7 | 19.6 | 9.8 | 48.8 | 20.9 | 17.4 | 2.6 | | |
| LOS | E | B | A | D | C | B | A | | |
| Approach Delay | | 31.1 | | | 25.6 | 14.7 | | | |
| Approach LOS | | C | | | C | B | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 21.4

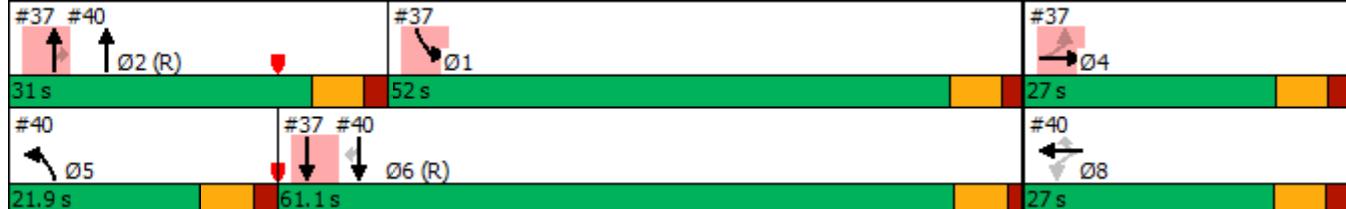
Intersection LOS: C

Intersection Capacity Utilization 85.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 40: SR 101L WB Off Ramp & 75th Ave



Timings

37: 75th Ave & SR 101L EB Off Ramp

04/10/2019



| Lane Group | EBL | EBT | NBT | NBR | SBL | SBT | Ø5 | Ø8 |
|----------------------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑ ↗ | ↗ ↗ | ↑↑↑ | ↑ | ↗ ↗ | ↑↑ | | |
| Traffic Volume (vph) | 330 | 87 | 380 | 400 | 1260 | 640 | | |
| Future Volume (vph) | 330 | 87 | 380 | 400 | 1260 | 640 | | |
| Turn Type | Perm | NA | NA | Perm | Prot | NA | | |
| Protected Phases | | | | | 1 | 6 | 5 | 8 |
| Permitted Phases | 4 | | | | 2 | | | |
| Detector Phase | 4 | 4 | 2 | 2 | 1 | 6 | | |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.4 | 24.4 | 24.3 | 24.3 | 11.1 | 23.7 | 11.3 | 24.6 |
| Total Split (s) | 27.0 | 27.0 | 31.0 | 31.0 | 52.0 | 61.1 | 21.9 | 27.0 |
| Total Split (%) | 24.5% | 24.5% | 28.2% | 28.2% | 47.3% | 55.5% | 20% | 25% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.1 | 2.1 | 2.0 | 2.0 | 1.8 | 1.4 | 2.0 | 2.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.4 | 6.4 | 6.3 | 6.3 | 6.1 | 5.7 | | |
| Lead/Lag | | | Lead | Lead | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | C-Max | C-Max | None | C-Max | None | None |
| Act Effect Green (s) | 20.5 | 20.5 | 24.8 | 24.8 | 45.9 | 58.4 | | |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.23 | 0.23 | 0.42 | 0.53 | | |
| v/c Ratio | 0.60 | 0.54 | 0.36 | 0.87 | 0.96 | 0.37 | | |
| Control Delay | 50.3 | 42.0 | 37.0 | 43.1 | 37.2 | 9.5 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | | |
| Total Delay | 50.3 | 42.0 | 37.0 | 43.1 | 37.2 | 9.6 | | |
| LOS | D | D | D | D | D | A | | |
| Approach Delay | | 44.9 | 40.1 | | | 27.9 | | |
| Approach LOS | | D | D | | | C | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 33.5

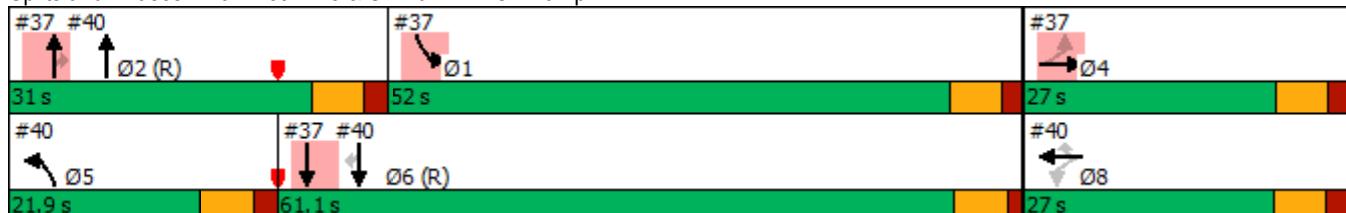
Intersection LOS: C

Intersection Capacity Utilization 85.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 37: 75th Ave & SR 101L EB Off Ramp



Timings

48: SR 101L WB Off Ramp & 67th Ave

04/10/2019



| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR | Ø1 | Ø4 |
|----------------------|-------|--------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑ | ↔↔ | ↑ | ↑ | ↑↑ | ↑↑↑ | ↑ | | |
| Traffic Volume (vph) | 800 | 177 | 420 | 230 | 880 | 1700 | 410 | | |
| Future Volume (vph) | 800 | 177 | 420 | 230 | 880 | 1700 | 410 | | |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm | | |
| Protected Phases | | | | 8 | 5 | 2 | 6 | 1 | 4 |
| Permitted Phases | 8 | | | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.3 | 24.3 | 24.3 | 11.0 | 24.0 | 23.9 | 23.9 | 10.9 | 24.4 |
| Total Split (s) | 33.0 | 33.0 | 33.0 | 21.0 | 38.0 | 56.0 | 56.0 | 39.0 | 33.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 19.1% | 34.5% | 50.9% | 50.9% | 35% | 30% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.7 | 1.7 | 1.6 | 1.6 | 1.6 | 2.1 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.0 | 6.0 | 5.9 | 5.9 | | |
| Lead/Lag | | | | Lag | Lag | Lead | Lead | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | Max | Max |
| Act Effect Green (s) | 26.7 | 26.7 | 26.7 | 15.0 | 32.0 | 50.1 | 50.1 | | |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.24 | 0.14 | 0.29 | 0.46 | 0.46 | | |
| v/c Ratio | 1.12 | 1.08dl | 0.56 | 1.04 | 0.93 | 0.63 | 0.51 | | |
| Control Delay | 120.1 | 73.3 | 7.6 | 100.6 | 41.6 | 24.1 | 9.3 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | | |
| Total Delay | 120.1 | 73.3 | 7.6 | 100.6 | 41.6 | 24.3 | 9.3 | | |
| LOS | F | E | A | F | D | C | A | | |
| Approach Delay | | 72.1 | | | 53.8 | 21.4 | | | |
| Approach LOS | | E | | | D | C | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.18

Intersection Signal Delay: 44.5

Intersection LOS: D

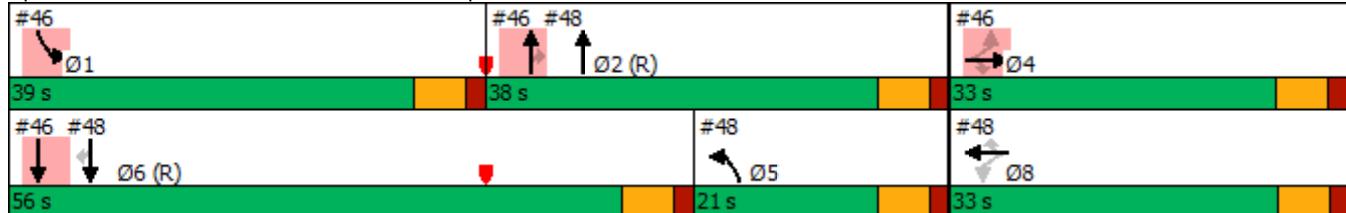
Intersection Capacity Utilization 102.6%

ICU Level of Service G

Analysis Period (min) 15

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 48: SR 101L WB Off Ramp & 67th Ave



Timings

46: 67th Ave & SR 101L EB Off Ramp

04/10/2019



| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT | Ø5 | Ø8 |
|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Lane Configurations | ↖ ↗ ↘ ↗ ↗ ↘ ↗ ↗ ↘ ↗ | ↖ ↗ ↘ ↗ ↗ ↘ ↗ ↗ ↘ ↗ | ↖ ↗ ↘ ↗ ↗ ↘ ↗ ↗ ↘ ↗ | ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ | ↖ ↗ ↘ ↗ ↗ ↘ ↗ ↗ ↘ ↗ | ↖ ↗ ↘ ↗ ↗ ↘ ↗ ↗ ↘ ↗ | ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ | ↖ ↗ ↘ ↗ ↗ ↘ ↗ ↗ ↘ ↗ | ↖ ↗ ↘ ↗ ↗ ↘ ↗ ↗ ↘ ↗ |
| Traffic Volume (vph) | 400 | 370 | 180 | 710 | 570 | 1070 | 1430 | | |
| Future Volume (vph) | 400 | 370 | 180 | 710 | 570 | 1070 | 1430 | | |
| Turn Type | Perm | NA | Perm | NA | Perm | Prot | NA | | |
| Protected Phases | | | | 4 | | 2 | | 1 | 6 |
| Permitted Phases | 4 | | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.4 | 24.4 | 24.4 | 24.0 | 24.0 | 10.9 | 23.9 | 11.0 | 24.3 |
| Total Split (s) | 33.0 | 33.0 | 33.0 | 38.0 | 38.0 | 39.0 | 56.0 | 21.0 | 33.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 34.5% | 34.5% | 35.5% | 50.9% | 19% | 30% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 1.7 | 1.7 | 1.6 | 1.6 | 1.7 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.4 | 6.4 | 6.4 | 6.0 | 6.0 | 5.9 | 5.9 | | |
| Lead/Lag | | | | Lag | Lag | Lead | Lead | Lag | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes | Yes | |
| Recall Mode | Max | Max | Max | C-Max | C-Max | Max | C-Max | None | None |
| Act Effect Green (s) | 26.6 | 26.6 | 26.6 | 32.0 | 32.0 | 33.1 | 50.1 | | |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.24 | 0.29 | 0.29 | 0.30 | 0.46 | | |
| v/c Ratio | 0.71 | 0.76 | 0.37 | 0.52 | 1.18 | 1.13 | 0.96 | | |
| Control Delay | 49.8 | 45.9 | 7.4 | 34.1 | 130.8 | 89.2 | 27.4 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.2 | 0.0 | | |
| Total Delay | 49.8 | 45.9 | 7.4 | 34.3 | 130.8 | 89.4 | 27.4 | | |
| LOS | D | D | A | C | F | F | C | | |
| Approach Delay | | 40.4 | | | 77.3 | | 54.0 | | |
| Approach LOS | | D | | | E | | D | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.18

Intersection Signal Delay: 57.5

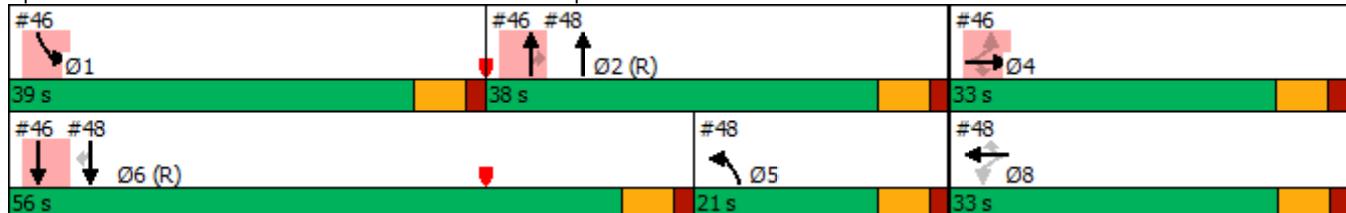
Intersection LOS: E

Intersection Capacity Utilization 102.6%

ICU Level of Service G

Analysis Period (min) 15

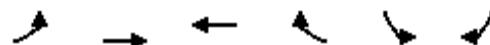
Splits and Phases: 46: 67th Ave & SR 101L EB Off Ramp



Timings

3: Bell Rd & 92nd Ave

02/26/2019



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↗ | ↑↑↑ | ↑↑↑ | ↗ | ↖ | ↗ |
| Traffic Volume (vph) | 10 | 1889 | 1460 | 180 | 308 | 13 |
| Future Volume (vph) | 10 | 1889 | 1460 | 180 | 308 | 13 |
| Turn Type | pm+pt | NA | NA | Perm | Perm | Perm |
| Protected Phases | 7 | 4 | 8 | | | |
| Permitted Phases | 4 | | | 8 | 6 | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.8 | 24.1 | 24.1 | 24.1 | 23.6 | 23.6 |
| Total Split (s) | 11.0 | 62.0 | 51.0 | 51.0 | 38.0 | 38.0 |
| Total Split (%) | 11.0% | 62.0% | 51.0% | 51.0% | 38.0% | 38.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.5 | 1.5 | 1.5 | 1.5 | 1.3 | 1.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.6 | 5.6 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |
| Act Effect Green (s) | 56.2 | 56.2 | 54.0 | 54.0 | 32.4 | 32.4 |
| Actuated g/C Ratio | 0.56 | 0.56 | 0.54 | 0.54 | 0.32 | 0.32 |
| v/c Ratio | 0.06 | 0.72 | 0.58 | 0.21 | 0.58 | 0.03 |
| Control Delay | 10.5 | 17.9 | 4.9 | 0.4 | 33.2 | 11.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 10.5 | 17.9 | 4.9 | 0.4 | 33.2 | 11.3 |
| LOS | B | B | A | A | C | B |
| Approach Delay | | 17.9 | 4.4 | | 32.3 | |
| Approach LOS | | B | A | | C | |

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 99 (99%), Referenced to phase 4:EBTL and 8:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 13.4

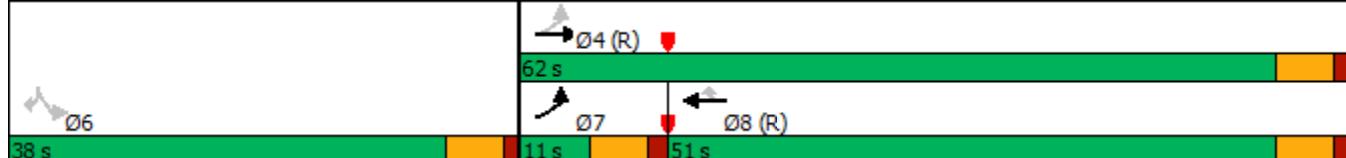
Intersection LOS: B

Intersection Capacity Utilization 63.1%

ICU Level of Service B

Analysis Period (min) 15

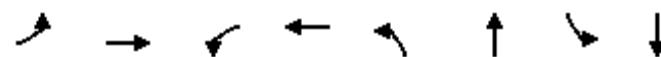
Splits and Phases: 3: Bell Rd & 92nd Ave



Timings

7: Bell Rd & 91st Ave

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Lane Configurations | ↖ ↗ ↘ ↗ ↘ ↗ ↘ ↗ | ↑ ↗ ↘ ↗ ↘ ↗ ↘ ↗ | ↖ ↗ ↘ ↗ ↘ ↗ ↘ ↗ | ↑ ↗ ↘ ↗ ↘ ↗ ↘ ↗ | ↖ ↗ ↘ ↗ ↘ ↗ ↘ ↗ | ↑ ↗ ↘ ↗ ↘ ↗ ↘ ↗ | ↖ ↗ ↘ ↗ ↘ ↗ ↘ ↗ | ↑ ↗ ↘ ↗ ↘ ↗ ↘ ↗ |
| Traffic Volume (vph) | 130 | 1790 | 150 | 1310 | 70 | 220 | 280 | 250 |
| Future Volume (vph) | 130 | 1790 | 150 | 1310 | 70 | 220 | 280 | 250 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | 4 | | | 8 | | 2 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.2 | 24.2 | 11.2 | 24.2 | 10.7 | 23.7 | 10.6 | 23.6 |
| Total Split (s) | 14.7 | 45.7 | 13.2 | 44.2 | 11.6 | 23.8 | 17.3 | 29.5 |
| Total Split (%) | 14.7% | 45.7% | 13.2% | 44.2% | 11.6% | 23.8% | 17.3% | 29.5% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.9 | 1.9 | 1.9 | 1.9 | 1.4 | 1.4 | 1.3 | 1.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 | 5.6 | 5.6 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | None | Max |
| Act Effect Green (s) | 39.5 | 39.5 | 38.0 | 38.0 | 24.0 | 18.1 | 35.5 | 26.2 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.38 | 0.38 | 0.24 | 0.18 | 0.36 | 0.26 |
| v/c Ratio | 0.62 | 1.01 | 0.81 | 0.87 | 0.27 | 0.55 | 0.89 | 0.41 |
| Control Delay | 34.9 | 41.0 | 53.4 | 34.1 | 25.2 | 28.5 | 55.6 | 28.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 34.9 | 41.0 | 53.4 | 34.1 | 25.2 | 28.5 | 55.6 | 28.2 |
| LOS | C | D | D | C | C | C | E | C |
| Approach Delay | | 40.6 | | 35.8 | | 27.9 | | 40.4 |
| Approach LOS | | D | | D | | C | | D |

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 37.7

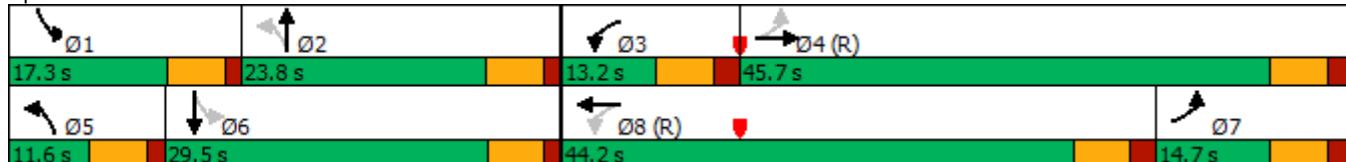
Intersection LOS: D

Intersection Capacity Utilization 90.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 7: Bell Rd & 91st Ave



Timings

12: 87th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
|----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ ↖ ↗ |
| Traffic Volume (vph) | 80 | 2640 | 160 | 2010 | 70 | 40 | 40 | 100 | 80 | 60 | 40 | |
| Future Volume (vph) | 80 | 2640 | 160 | 2010 | 70 | 40 | 40 | 100 | 80 | 60 | 40 | |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | Perm | |
| Protected Phases | 7 | 4 | 3 | 8 | | | 2 | | | 6 | | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 11.3 | 24.3 | 11.3 | 24.3 | 24.3 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 | |
| Total Split (s) | 15.8 | 79.2 | 17.0 | 80.4 | 80.4 | 23.8 | 23.8 | 23.8 | 23.8 | 23.8 | 23.8 | |
| Total Split (%) | 13.2% | 66.0% | 14.2% | 67.0% | 67.0% | 19.8% | 19.8% | 19.8% | 19.8% | 19.8% | 19.8% | |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | |
| Lead/Lag | Lead | Lead | Lag | Lag | Lag | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | C-Max | Max | Max | Max | Max | Max | Max | |
| Act Effect Green (s) | 72.9 | 72.9 | 75.8 | 75.8 | 75.8 | 18.1 | 18.1 | 18.1 | 18.1 | 18.1 | 18.1 | |
| Actuated g/C Ratio | 0.61 | 0.61 | 0.63 | 0.63 | 0.63 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | |
| v/c Ratio | 0.49 | 0.95 | 0.79 | 0.68 | 0.07 | 0.21 | 0.15 | 0.30 | 0.43 | 0.23 | 0.12 | |
| Control Delay | 23.1 | 30.8 | 46.1 | 10.4 | 2.0 | 47.9 | 46.0 | 5.2 | 53.5 | 47.3 | 0.7 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 23.1 | 30.8 | 46.1 | 10.4 | 2.0 | 47.9 | 46.0 | 5.2 | 53.5 | 47.3 | 0.7 | |
| LOS | C | C | D | B | A | D | D | A | D | D | A | |
| Approach Delay | | 30.5 | | | 12.7 | | | 23.6 | | | 39.8 | |
| Approach LOS | | C | | B | | | C | | | D | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 113 (94%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 23.2

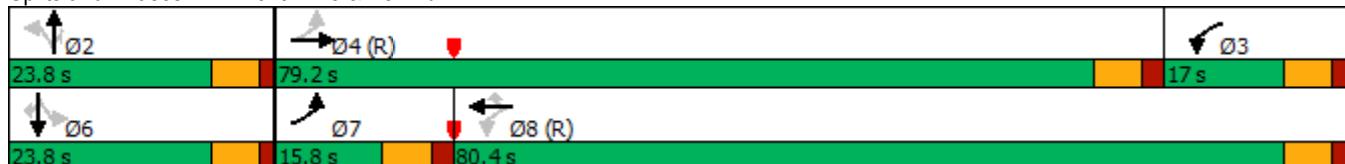
Intersection LOS: C

Intersection Capacity Utilization 87.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 12: 87th Ave & Bell Rd



Timings

17: 84th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ | ↑ ↗ ↘ ↖ ↙ ↖ ↗ ↘ ↖ ↙ |
| Traffic Volume (vph) | 25 | 2480 | 201 | 2052 | 109 | 13 | 1 | 58 | 1 |
| Future Volume (vph) | 25 | 2480 | 201 | 2052 | 109 | 13 | 1 | 58 | 1 |
| Turn Type | Prot | NA | Prot | NA | Perm | pm+pt | NA | pm+pt | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.7 | 23.7 | 10.7 | 23.7 | 23.7 | 11.5 | 24.5 | 11.5 | 24.5 |
| Total Split (s) | 11.6 | 65.0 | 19.0 | 72.4 | 72.4 | 11.5 | 24.5 | 11.5 | 24.5 |
| Total Split (%) | 9.7% | 54.2% | 15.8% | 60.3% | 60.3% | 9.6% | 20.4% | 9.6% | 20.4% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 2.2 | 2.2 | 2.2 | 2.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | C-Max | None | Max | None | Max |
| Act Effect Green (s) | 5.8 | 59.3 | 13.3 | 71.3 | 71.3 | 20.3 | 20.3 | 24.9 | 24.9 |
| Actuated g/C Ratio | 0.05 | 0.49 | 0.11 | 0.59 | 0.59 | 0.17 | 0.17 | 0.21 | 0.21 |
| v/c Ratio | 0.31 | 1.10 | 1.11 | 0.74 | 0.12 | 0.06 | 0.23 | 0.28 | 0.04 |
| Control Delay | 42.8 | 61.7 | 146.4 | 20.3 | 0.2 | 44.7 | 12.0 | 45.5 | 21.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.8 | 61.7 | 146.4 | 20.3 | 0.2 | 44.7 | 12.0 | 45.5 | 21.8 |
| LOS | D | E | F | C | A | D | B | D | C |
| Approach Delay | | 61.5 | | | 30.1 | | | 17.0 | 41.5 |
| Approach LOS | | E | | | C | | | B | D |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 12 (10%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 45.8

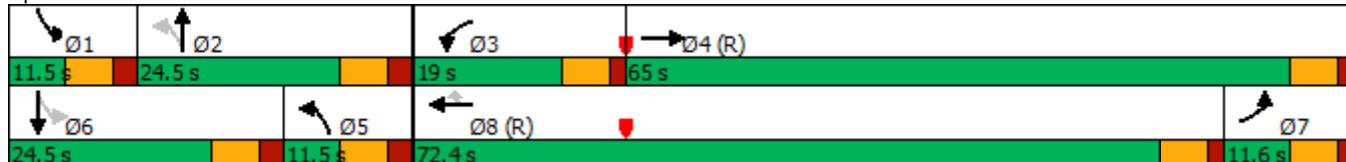
Intersection LOS: D

Intersection Capacity Utilization 84.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 17: 84th Ave & Bell Rd



Timings

11: 83rd Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↖ | ↑↑↑↖ | ↑↖ | ↑↑↑↖ | ↑↖ | ↑↑ | ↑↖ | ↑↖ | ↑↑↑ | ↑↖ |
| Traffic Volume (vph) | 250 | 2010 | 100 | 770 | 250 | 270 | 120 | 310 | 330 | 150 |
| Future Volume (vph) | 250 | 2010 | 100 | 770 | 250 | 270 | 120 | 310 | 330 | 150 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | 2 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.9 | 24.9 | 11.9 | 24.9 | 12.2 | 25.2 | 25.2 | 12.1 | 25.1 | 25.1 |
| Total Split (s) | 22.6 | 57.0 | 13.2 | 47.6 | 20.4 | 27.4 | 27.4 | 22.4 | 29.4 | 29.4 |
| Total Split (%) | 18.8% | 47.5% | 11.0% | 39.7% | 17.0% | 22.8% | 22.8% | 18.7% | 24.5% | 24.5% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.6 | 2.6 | 2.6 | 2.6 | 2.9 | 2.9 | 2.9 | 2.8 | 2.8 | 2.8 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 6.9 | 7.2 | 7.2 | 7.2 | 7.1 | 7.1 | 7.1 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |
| Act Effect Green (s) | 14.0 | 50.1 | 6.3 | 42.4 | 12.7 | 20.7 | 20.7 | 14.8 | 22.8 | 22.8 |
| Actuated g/C Ratio | 0.12 | 0.42 | 0.05 | 0.35 | 0.11 | 0.17 | 0.17 | 0.12 | 0.19 | 0.19 |
| v/c Ratio | 0.68 | 0.92 | 0.61 | 0.41 | 0.75 | 0.48 | 0.19 | 0.80 | 0.37 | 0.34 |
| Control Delay | 55.9 | 33.2 | 70.2 | 29.5 | 65.4 | 48.0 | 0.7 | 65.8 | 43.9 | 3.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 55.9 | 33.2 | 70.2 | 29.5 | 65.4 | 48.0 | 0.7 | 65.8 | 43.9 | 3.2 |
| LOS | E | C | E | C | E | D | A | E | D | A |
| Approach Delay | | 35.5 | | | 33.8 | | 45.9 | | 44.7 | |
| Approach LOS | | D | | | C | | D | | D | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 71 (59%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 38.0

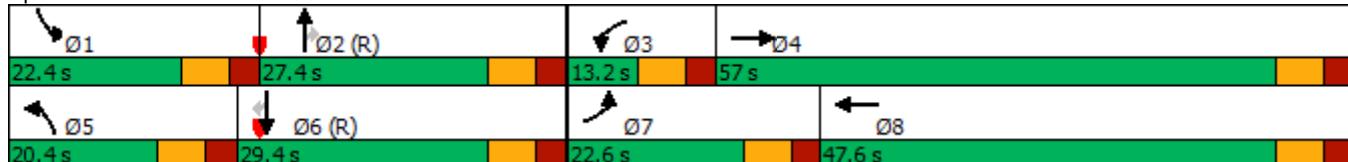
Intersection LOS: D

Intersection Capacity Utilization 76.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 11: 83rd Ave & Bell Rd



Timings

27: 79th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑↑ | ↑ | ↑ | ↑ | ↑ | ↑↑ | ↑ |
| Traffic Volume (vph) | 170 | 2080 | 20 | 850 | 20 | 10 | 10 | 60 | 20 | 50 |
| Future Volume (vph) | 170 | 2080 | 20 | 850 | 20 | 10 | 10 | 60 | 20 | 50 |
| Turn Type | Prot | NA | Prot | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 2 | | 2 | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.9 | 24.9 | 11.7 | 24.7 | 11.6 | 24.6 | 24.6 | 11.4 | 24.4 | 24.4 |
| Total Split (s) | 21.0 | 69.0 | 13.0 | 61.0 | 12.0 | 25.0 | 25.0 | 13.0 | 26.0 | 26.0 |
| Total Split (%) | 17.5% | 57.5% | 10.8% | 50.8% | 10.0% | 20.8% | 20.8% | 10.8% | 21.7% | 21.7% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.6 | 2.6 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.1 | 2.1 | 2.1 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.9 | 6.9 | 6.7 | 6.7 | 6.6 | 6.6 | 6.6 | 6.4 | 6.4 | 6.4 |
| Lead/Lag | Lead | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 11.6 | 67.3 | 6.0 | 56.8 | 25.3 | 21.0 | 21.0 | 28.4 | 24.4 | 24.4 |
| Actuated g/C Ratio | 0.10 | 0.56 | 0.05 | 0.47 | 0.21 | 0.18 | 0.18 | 0.24 | 0.20 | 0.20 |
| v/c Ratio | 0.56 | 0.65 | 0.13 | 0.34 | 0.07 | 0.03 | 0.02 | 0.20 | 0.03 | 0.11 |
| Control Delay | 58.1 | 20.0 | 32.0 | 9.8 | 34.1 | 43.8 | 0.1 | 35.7 | 41.9 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 58.1 | 20.0 | 32.0 | 9.8 | 34.1 | 43.8 | 0.1 | 35.7 | 41.9 | 0.4 |
| LOS | E | B | C | A | C | D | A | D | D | A |
| Approach Delay | | 22.8 | | 10.2 | | 28.0 | | | 23.2 | |
| Approach LOS | | C | | B | | C | | | C | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 111 (93%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 19.4

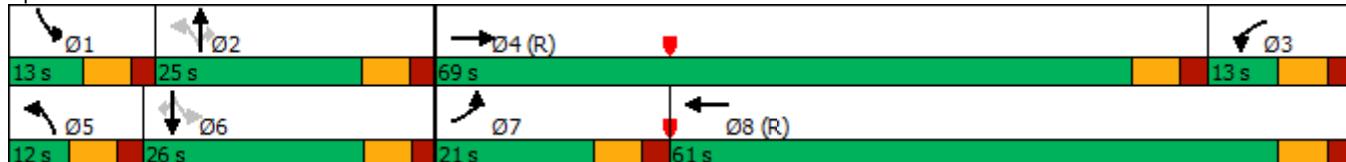
Intersection LOS: B

Intersection Capacity Utilization 61.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 27: 79th Ave & Bell Rd



Timings

32: 77th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑ |
| Traffic Volume (vph) | 230 | 1790 | 30 | 970 | 10 | 20 | 30 | 10 | 20 |
| Future Volume (vph) | 230 | 1790 | 30 | 970 | 10 | 20 | 30 | 10 | 20 |
| Turn Type | Prot | NA | Prot | NA | pm+pt | NA | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | 2 | | 6 | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.7 | 24.7 | 11.6 | 24.6 | 11.6 | 24.6 | 11.6 | 24.6 | 24.6 |
| Total Split (s) | 25.0 | 68.0 | 13.0 | 56.0 | 13.0 | 26.7 | 12.3 | 26.0 | 26.0 |
| Total Split (%) | 20.8% | 56.7% | 10.8% | 46.7% | 10.8% | 22.3% | 10.3% | 21.7% | 21.7% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.7 | 6.7 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lag | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | None | Max | Max |
| Act Effect Green (s) | 18.3 | 71.4 | 6.2 | 54.4 | 25.8 | 20.1 | 28.1 | 24.8 | 24.8 |
| Actuated g/C Ratio | 0.15 | 0.60 | 0.05 | 0.45 | 0.22 | 0.17 | 0.23 | 0.21 | 0.21 |
| v/c Ratio | 0.48 | 0.55 | 0.19 | 0.39 | 0.03 | 0.06 | 0.10 | 0.03 | 0.04 |
| Control Delay | 30.9 | 2.6 | 56.8 | 22.7 | 33.2 | 31.5 | 34.0 | 38.0 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 30.9 | 2.6 | 56.8 | 22.7 | 33.2 | 31.5 | 34.0 | 38.0 | 0.1 |
| LOS | C | A | E | C | C | C | C | D | A |
| Approach Delay | | | | 5.7 | | 23.7 | | 32.0 | 23.4 |
| Approach LOS | | | | A | | C | | C | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 12.1

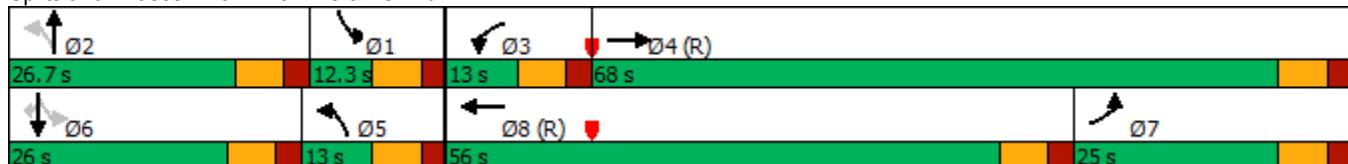
Intersection LOS: B

Intersection Capacity Utilization 57.0%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 32: 77th Ave & Bell Rd



Timings

37: 75th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑↑ | ↑↑↑ | ↑ |
| Traffic Volume (vph) | 140 | 2030 | 110 | 980 | 90 | 150 | 340 | 210 | 130 | 290 | 70 |
| Future Volume (vph) | 140 | 2030 | 110 | 980 | 90 | 150 | 340 | 210 | 130 | 290 | 70 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 18.0 | 25.3 | 12.2 | 25.2 | 25.2 | 11.4 | 24.4 | 24.4 | 11.3 | 24.3 | 24.3 |
| Total Split (s) | 18.0 | 56.6 | 14.0 | 52.6 | 52.6 | 15.0 | 26.0 | 26.0 | 13.4 | 24.4 | 24.4 |
| Total Split (%) | 16.4% | 51.5% | 12.7% | 47.8% | 47.8% | 13.6% | 23.6% | 23.6% | 12.2% | 22.2% | 22.2% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 3.0 | 3.0 | 2.9 | 2.9 | 2.9 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.3 | 7.3 | 7.2 | 7.2 | 7.2 | 6.4 | 6.4 | 6.4 | 6.3 | 6.3 | 6.3 |
| Lead/Lag | Lead | Lead | Lag | Lag | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 9.6 | 49.3 | 6.8 | 46.5 | 46.5 | 8.6 | 19.6 | 19.6 | 7.1 | 18.1 | 18.1 |
| Actuated g/C Ratio | 0.09 | 0.45 | 0.06 | 0.42 | 0.42 | 0.08 | 0.18 | 0.18 | 0.06 | 0.16 | 0.16 |
| v/c Ratio | 0.51 | 0.81 | 0.57 | 0.50 | 0.13 | 0.61 | 0.59 | 0.47 | 0.64 | 0.38 | 0.16 |
| Control Delay | 53.9 | 29.0 | 61.0 | 24.3 | 0.4 | 59.3 | 45.8 | 7.1 | 63.9 | 42.4 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 53.9 | 29.0 | 61.0 | 24.3 | 0.4 | 59.3 | 45.8 | 7.1 | 63.9 | 42.4 | 0.7 |
| LOS | D | C | E | C | A | E | D | A | E | D | A |
| Approach Delay | | 30.6 | | 25.9 | | | 37.1 | | | 42.2 | |
| Approach LOS | | C | | C | | | D | | | D | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 31.6

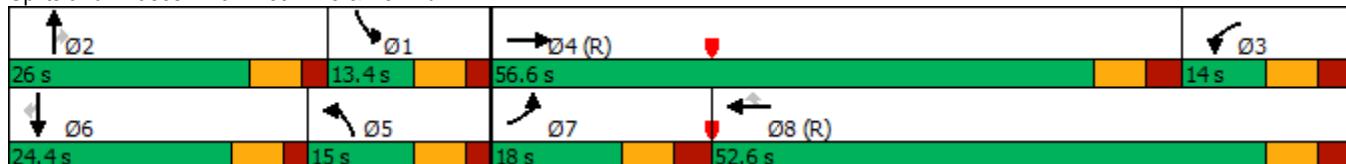
Intersection LOS: C

Intersection Capacity Utilization 71.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 37: 75th Ave & Bell Rd



Timings

42: 73rd Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↗ | ↑↑↗ | ↖ | ↑↑↖ | ↗ | ↖ | ↑ | ↗ | ↖ | ↗ |
| Traffic Volume (vph) | 25 | 2123 | 23 | 1051 | 39 | 18 | 1 | 60 | 60 | 18 |
| Future Volume (vph) | 25 | 2123 | 23 | 1051 | 39 | 18 | 1 | 60 | 60 | 18 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | Perm | NA | Perm | Perm | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | | 2 | | | |
| Permitted Phases | 4 | | | 8 | 2 | | 2 | 6 | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.3 | 24.3 | 11.3 | 24.3 | 24.3 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 |
| Total Split (s) | 11.6 | 63.4 | 11.6 | 63.4 | 63.4 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| Total Split (%) | 11.6% | 63.4% | 11.6% | 63.4% | 63.4% | 25.0% | 25.0% | 25.0% | 25.0% | 25.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lead | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | |
| Recall Mode | None | C-Max | None | C-Max | C-Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 64.1 | 64.1 | 61.7 | 61.7 | 61.7 | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 |
| Actuated g/C Ratio | 0.64 | 0.64 | 0.62 | 0.62 | 0.62 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| v/c Ratio | 0.08 | 0.71 | 0.15 | 0.36 | 0.04 | 0.08 | 0.00 | 0.15 | 0.25 | 0.05 |
| Control Delay | 9.6 | 14.5 | 11.0 | 10.5 | 0.1 | 34.8 | 33.0 | 0.7 | 37.9 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 9.6 | 14.5 | 11.0 | 10.5 | 0.1 | 34.8 | 33.0 | 0.7 | 37.9 | 0.2 |
| LOS | A | B | B | B | A | C | C | A | D | A |
| Approach Delay | | 14.4 | | | 10.2 | | | 9.0 | | |
| Approach LOS | | B | | | B | | | A | | |

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 13.2

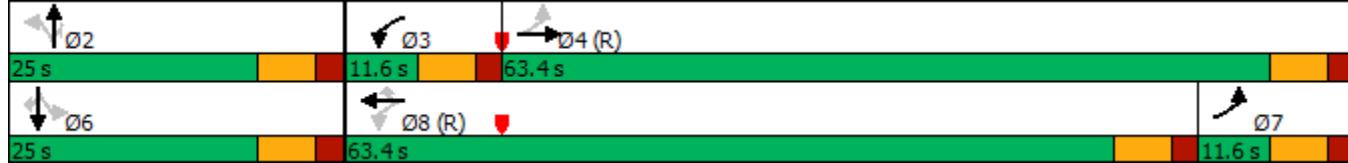
Intersection LOS: B

Intersection Capacity Utilization 65.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 42: 73rd Ave & Bell Rd



Timings

47: 69th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↗ | ↑↑↑ | ↗ | ↗ | ↑↑↗ | ↗ | ↑ | ↗ | ↗ | ↑ | ↗ |
| Traffic Volume (vph) | 29 | 2200 | 13 | 22 | 1067 | 19 | 1 | 59 | 83 | 1 | 28 |
| Future Volume (vph) | 29 | 2200 | 13 | 22 | 1067 | 19 | 1 | 59 | 83 | 1 | 28 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | 8 | | 2 | | 2 | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.9 | 23.9 | 23.9 | 10.9 | 23.9 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 |
| Total Split (s) | 11.0 | 74.0 | 74.0 | 11.0 | 74.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| Total Split (%) | 10.0% | 67.3% | 67.3% | 10.0% | 67.3% | 22.7% | 22.7% | 22.7% | 22.7% | 22.7% | 22.7% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 72.5 | 72.5 | 72.5 | 72.5 | 72.5 | 18.7 | 18.7 | 18.7 | 18.7 | 18.7 | 18.7 |
| Actuated g/C Ratio | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| v/c Ratio | 0.10 | 0.71 | 0.01 | 0.16 | 0.36 | 0.09 | 0.00 | 0.16 | 0.38 | 0.00 | 0.08 |
| Control Delay | 9.4 | 14.4 | 0.0 | 10.2 | 9.2 | 39.7 | 38.0 | 0.9 | 45.8 | 38.0 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 9.4 | 14.4 | 0.0 | 10.2 | 9.2 | 39.7 | 38.0 | 0.9 | 45.8 | 38.0 | 0.4 |
| LOS | A | B | A | B | A | D | D | A | D | D | A |
| Approach Delay | | | 14.2 | | | 9.2 | | 10.8 | | | 34.4 |
| Approach LOS | | | B | | | A | | B | | | C |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 13.2

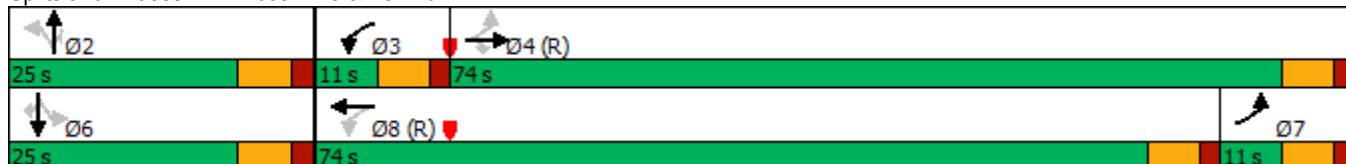
Intersection LOS: B

Intersection Capacity Utilization 66.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 47: 69th Ave & Bell Rd



Timings

52: 67th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↗ | ↑↑↑ ↗ | ↗ | ↗ | ↑↑↑ ↗ | ↗ | ↗ ↗ | ↑↑↑ ↗ | ↗ | ↗ ↗ | ↑↑↑ ↗ | ↗ |
| Traffic Volume (vph) | 150 | 2020 | 270 | 100 | 710 | 100 | 370 | 930 | 290 | 170 | 890 | 100 |
| Future Volume (vph) | 150 | 2020 | 270 | 100 | 710 | 100 | 370 | 930 | 290 | 170 | 890 | 100 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 12.0 | 25.0 | 25.0 | 12.0 | 25.0 | 25.0 | 11.1 | 24.1 | 24.1 | 10.9 | 23.9 | 23.9 |
| Total Split (s) | 19.0 | 56.3 | 56.3 | 12.0 | 49.3 | 49.3 | 21.2 | 39.0 | 39.0 | 12.7 | 30.5 | 30.5 |
| Total Split (%) | 15.8% | 46.9% | 46.9% | 10.0% | 41.1% | 41.1% | 17.7% | 32.5% | 32.5% | 10.6% | 25.4% | 25.4% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 1.8 | 1.8 | 1.8 | 1.6 | 1.6 | 1.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 6.1 | 6.1 | 6.1 | 5.9 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 60.0 | 49.3 | 49.3 | 48.6 | 43.6 | 43.6 | 15.1 | 32.9 | 32.9 | 6.8 | 24.6 | 24.6 |
| Actuated g/C Ratio | 0.50 | 0.41 | 0.41 | 0.40 | 0.36 | 0.36 | 0.13 | 0.27 | 0.27 | 0.06 | 0.20 | 0.20 |
| v/c Ratio | 0.46 | 1.05 | 0.38 | 0.80 | 0.42 | 0.16 | 0.93 | 1.04 | 0.58 | 0.95 | 0.93 | 0.22 |
| Control Delay | 20.4 | 69.6 | 9.0 | 60.7 | 29.7 | 0.5 | 81.6 | 83.0 | 23.2 | 110.2 | 62.2 | 1.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 20.4 | 69.6 | 9.0 | 60.7 | 29.7 | 0.5 | 81.6 | 83.0 | 23.2 | 110.2 | 62.2 | 1.0 |
| LOS | C | E | A | E | C | A | F | F | C | F | E | A |
| Approach Delay | | 59.9 | | | 29.9 | | | 71.8 | | | 64.0 | |
| Approach LOS | | E | | | C | | | E | | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 59.3

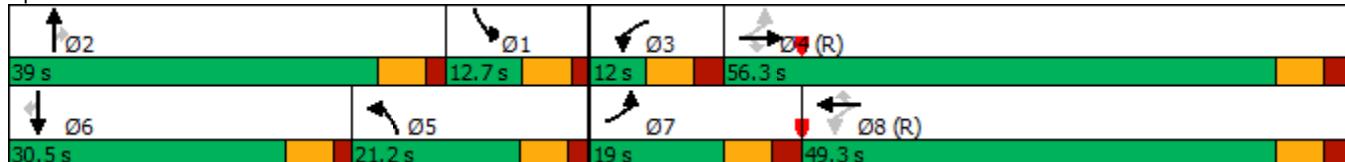
Intersection LOS: E

Intersection Capacity Utilization 96.8%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 52: 67th Ave & Bell Rd



Timings

57: 63rd Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Lane Configurations | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ ↗ ↘ |
| Traffic Volume (vph) | 128 | 2087 | 159 | 715 | 49 | 7 | 124 | 276 | 24 | 109 |
| Future Volume (vph) | 128 | 2087 | 159 | 715 | 49 | 7 | 124 | 276 | 24 | 109 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 2 | | | 6 | |
| Permitted Phases | | | | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.8 | 23.8 | 10.8 | 23.8 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 |
| Total Split (s) | 15.0 | 63.0 | 15.0 | 63.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 | 32.0 |
| Total Split (%) | 13.6% | 57.3% | 13.6% | 57.3% | 29.1% | 29.1% | 29.1% | 29.1% | 29.1% | 29.1% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.5 | 1.5 | 1.5 | 1.5 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 |
| Lead/Lag | Lead | Lag | Lead | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 65.7 | 57.4 | 67.1 | 58.1 | 25.8 | 25.8 | 25.8 | 25.8 | 25.8 | 25.8 |
| Actuated g/C Ratio | 0.60 | 0.52 | 0.61 | 0.53 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| v/c Ratio | 0.34 | 0.94 | 0.81 | 0.34 | 0.16 | 0.02 | 0.28 | 0.91 | 0.06 | 0.26 |
| Control Delay | 9.8 | 33.0 | 52.2 | 14.7 | 35.2 | 32.7 | 7.5 | 74.3 | 33.3 | 7.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 9.8 | 33.0 | 52.2 | 14.7 | 35.2 | 32.7 | 7.5 | 74.3 | 33.3 | 7.8 |
| LOS | A | C | D | B | D | C | A | E | C | A |
| Approach Delay | | 31.7 | | | 20.8 | | 16.0 | | 54.2 | |
| Approach LOS | | C | | | C | | B | | D | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 30.6

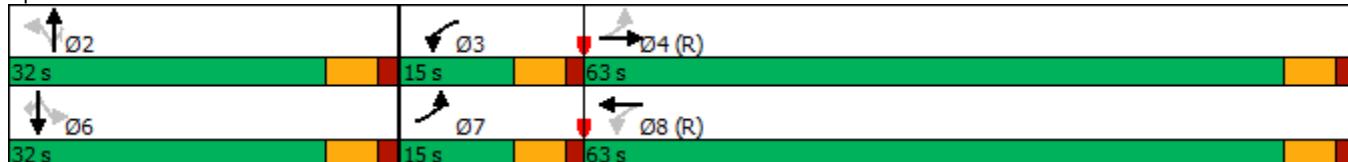
Intersection LOS: C

Intersection Capacity Utilization 90.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 57: 63rd Ave & Bell Rd



Timings

62: 59th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↗ | ↑↑↑ ↗ | ↗ | ↗ | ↑↑↑ ↗ | ↗ | ↗ | ↑↑↑ ↗ | ↗ | ↗ | ↑↑↑ ↗ | ↗ |
| Traffic Volume (vph) | 260 | 1960 | 310 | 140 | 730 | 130 | 160 | 640 | 170 | 260 | 850 | 120 |
| Future Volume (vph) | 260 | 1960 | 310 | 140 | 730 | 130 | 160 | 640 | 170 | 260 | 850 | 120 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.4 | 24.4 | 24.4 | 11.6 | 24.6 | 24.6 | 10.9 | 23.9 | 23.9 | 11.0 | 24.0 | 24.0 |
| Total Split (s) | 29.0 | 54.8 | 54.8 | 13.1 | 38.9 | 38.9 | 13.0 | 28.1 | 28.1 | 24.0 | 39.1 | 39.1 |
| Total Split (%) | 24.2% | 45.7% | 45.7% | 10.9% | 32.4% | 32.4% | 10.8% | 23.4% | 23.4% | 20.0% | 32.6% | 32.6% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.3 | 2.3 | 2.3 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.4 | 6.4 | 6.4 | 6.6 | 6.6 | 6.6 | 5.9 | 5.9 | 5.9 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 61.2 | 48.4 | 48.4 | 44.6 | 38.1 | 38.1 | 7.1 | 22.2 | 22.2 | 18.0 | 33.1 | 33.1 |
| Actuated g/C Ratio | 0.51 | 0.40 | 0.40 | 0.37 | 0.32 | 0.32 | 0.06 | 0.18 | 0.18 | 0.15 | 0.28 | 0.28 |
| v/c Ratio | 0.71 | 1.04 | 0.45 | 0.96 | 0.49 | 0.21 | 0.86 | 1.06 | 0.37 | 1.07 | 0.95 | 0.22 |
| Control Delay | 27.4 | 66.3 | 12.4 | 92.3 | 35.1 | 0.7 | 90.8 | 100.2 | 3.0 | 123.0 | 61.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 27.4 | 66.3 | 12.4 | 92.3 | 35.1 | 0.7 | 90.8 | 100.2 | 3.0 | 123.0 | 61.4 | 1.1 |
| LOS | C | E | B | F | D | A | F | F | A | F | E | A |
| Approach Delay | | 55.7 | | | 38.6 | | | 81.6 | | | 68.6 | |
| Approach LOS | | E | | | D | | | F | | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 59.9

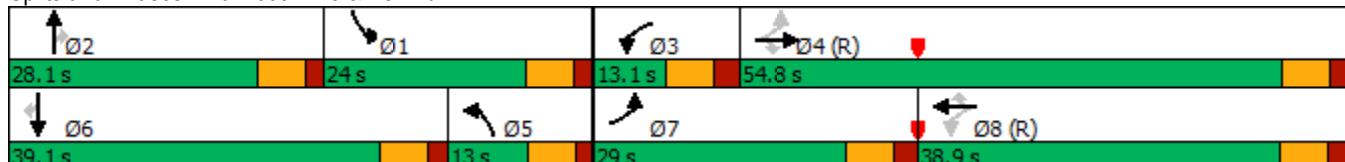
Intersection LOS: E

Intersection Capacity Utilization 98.5%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 62: 59th Ave & Bell Rd



Timings

4: Thunderbird Rd & SR 101L SB Off Ramp

04/10/2019



| Lane Group | EBT | EBR | WBL | WBT | SBL | SBT | SBR | Ø2 | Ø7 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑↑↑↑↑ | ↑ | ↑↑ | ↑↑↑↑ | ↑ | ↔ | ↑ | | |
| Traffic Volume (vph) | 1530 | 830 | 900 | 1730 | 410 | 0 | 570 | | |
| Future Volume (vph) | 1530 | 830 | 900 | 1730 | 410 | 0 | 570 | | |
| Turn Type | NA | Perm | Prot | NA | Perm | NA | Perm | | |
| Protected Phases | 4 | | | 3 | 8 | | 6 | 2 | 7 |
| Permitted Phases | | | | 4 | | 6 | | 6 | |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.6 | 24.6 | 11.0 | 24.0 | 25.3 | 25.3 | 25.3 | 25.3 | 10.9 |
| Total Split (s) | 34.0 | 34.0 | 32.0 | 42.0 | 44.0 | 44.0 | 44.0 | 44.0 | 24.0 |
| Total Split (%) | 30.9% | 30.9% | 29.1% | 38.2% | 40.0% | 40.0% | 40.0% | 40% | 22% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.3 | 2.3 | 1.7 | 1.7 | 3.0 | 3.0 | 3.0 | 3.0 | 1.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.6 | 6.6 | 6.0 | 6.0 | 7.3 | 7.3 | 7.3 | | |
| Lead/Lag | Lead | Lead | Lag | Lead | | | | Lag | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | Max | Max |
| Act Effect Green (s) | 27.4 | 27.4 | 26.0 | 36.0 | 36.7 | 36.7 | 36.7 | | |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.24 | 0.33 | 0.33 | 0.33 | 0.33 | | |
| v/c Ratio | 0.88 | 0.97 | 1.19 | 1.12 | 0.66 | 0.56 | 0.46 | | |
| Control Delay | 46.0 | 33.3 | 114.8 | 89.8 | 37.8 | 16.7 | 5.1 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 46.0 | 33.3 | 114.8 | 89.8 | 37.8 | 16.7 | 5.1 | | |
| LOS | D | C | F | F | D | B | A | | |
| Approach Delay | 41.5 | | | 98.3 | | 20.4 | | | |
| Approach LOS | D | | | F | | C | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 63.1

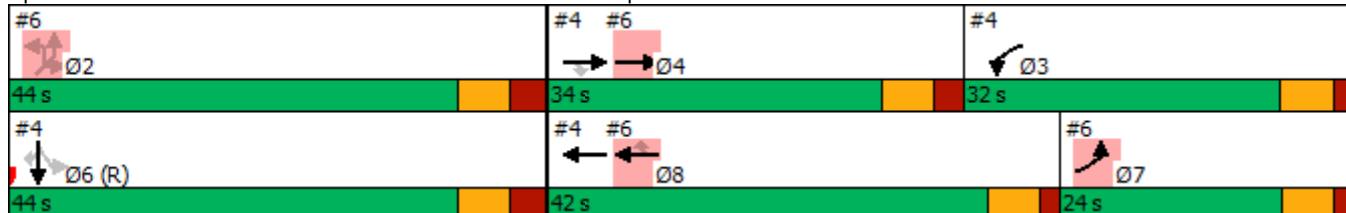
Intersection LOS: E

Intersection Capacity Utilization 110.8%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 4: Thunderbird Rd & SR 101L SB Off Ramp



Timings

6: SR 101L NB Off Ramp & Thunderbird Rd

04/10/2019



| Lane Group | EBL | EBT | WBT | WBR | NEL2 | NEL | NER | Ø3 | Ø6 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑↑↑ | ↑ | ↑ | ↑↑ | ↑ | | |
| Traffic Volume (vph) | 620 | 1320 | 2030 | 350 | 600 | 0 | 900 | | |
| Future Volume (vph) | 620 | 1320 | 2030 | 350 | 600 | 0 | 900 | | |
| Turn Type | Prot | NA | NA | Perm | Perm | Perm | Perm | | |
| Protected Phases | 7 | 4 | 8 | | | | | 3 | 6 |
| Permitted Phases | | | | 8 | 2 | 2 | 2 | | |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 | 2 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.9 | 24.6 | 24.0 | 24.0 | 25.3 | 25.3 | 25.3 | 11.0 | 25.3 |
| Total Split (s) | 24.0 | 34.0 | 42.0 | 42.0 | 44.0 | 44.0 | 44.0 | 32.0 | 44.0 |
| Total Split (%) | 21.8% | 30.9% | 38.2% | 38.2% | 40.0% | 40.0% | 40.0% | 29% | 40% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.6 | 2.3 | 1.7 | 1.7 | 3.0 | 3.0 | 3.0 | 1.7 | 3.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 5.9 | 6.6 | 6.0 | 6.0 | 7.3 | 7.3 | 7.3 | | |
| Lead/Lag | Lag | Lead | Lead | Lead | | | | Lag | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | Max | None | None | None | Max | Max | Max | None | C-Max |
| Act Effect Green (s) | 18.1 | 27.4 | 36.0 | 36.0 | 36.7 | 36.7 | 36.7 | | |
| Actuated g/C Ratio | 0.16 | 0.25 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | | |
| v/c Ratio | 1.18 | 1.12 | 0.89 | 0.52 | 1.09 | 0.58 | 0.60 | | |
| Control Delay | 120.0 | 107.6 | 40.3 | 9.2 | 100.8 | 6.6 | 6.9 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 120.0 | 107.6 | 40.3 | 9.2 | 100.8 | 6.6 | 6.9 | | |
| LOS | F | F | D | A | F | A | A | | |
| Approach Delay | | 111.5 | 35.8 | | | 44.4 | | | |
| Approach LOS | | F | D | | | D | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 63.3

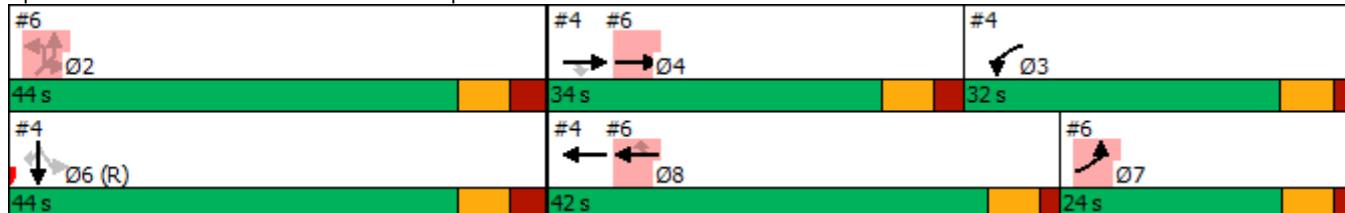
Intersection LOS: E

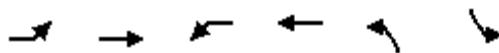
Intersection Capacity Utilization 110.8%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 6: SR 101L NB Off Ramp & Thunderbird Rd





| Lane Group | EBL | EBT | WBL | WBT | NBL | SBL |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑ | ↑↑ | ↑↑↑ | ↑↑ | ↑↑ |
| Traffic Volume (vph) | 990 | 1140 | 990 | 1450 | 550 | 350 |
| Future Volume (vph) | 990 | 1140 | 990 | 1450 | 550 | 350 |
| Turn Type | Prot | NA | Prot | NA | Prot | Prot |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 1 |
| Permitted Phases | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 1 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 13.0 | 26.0 | 13.1 | 26.1 | 12.3 | 12.1 |
| Total Split (s) | 44.0 | 42.3 | 46.7 | 45.0 | 31.0 | 31.0 |
| Total Split (%) | 36.7% | 35.3% | 38.9% | 37.5% | 25.8% | 25.8% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 3.7 | 3.7 | 3.8 | 3.8 | 3.0 | 2.8 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 8.0 | 8.0 | 8.1 | 8.1 | 7.3 | 7.1 |
| Lead/Lag | Lead | Lag | Lead | Lag | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None |
| Act Effect Green (s) | 36.5 | 34.9 | 38.6 | 36.9 | 23.2 | 23.4 |
| Actuated g/C Ratio | 0.30 | 0.29 | 0.32 | 0.31 | 0.19 | 0.20 |
| v/c Ratio | 1.02 | 0.82 | 0.97 | 1.00 | 0.90 | 0.57 |
| Control Delay | 74.2 | 45.3 | 29.6 | 42.1 | 65.4 | 47.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 74.2 | 45.3 | 29.6 | 42.1 | 65.4 | 47.4 |
| LOS | E | D | C | D | E | D |
| Approach Delay | | 58.7 | | 37.0 | | |
| Approach LOS | | E | | D | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 49.0

Intersection LOS: D

Intersection Capacity Utilization 91.4%

ICU Level of Service F

Analysis Period (min) 15

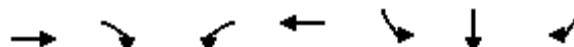
Splits and Phases: 16: SR 101L & Bell Rd



Timings

30: Union Hills Dr & SR 101L SB Off Ramp

04/10/2019



| Lane Group | EBT | EBR | WBL | WBT | SBL | SBT | SBR | Ø2 | Ø7 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations | ↑↑↑↑↑ | ↑ | ↑↑ | ↑↑↑↑ | ↑ | ↑↑ | ↑↑ | | |
| Traffic Volume (vph) | 1420 | 460 | 330 | 2040 | 260 | 13 | 660 | | |
| Future Volume (vph) | 1420 | 460 | 330 | 2040 | 260 | 13 | 660 | | |
| Turn Type | NA | Perm | Prot | NA | Perm | NA | Perm | | |
| Protected Phases | 4 | | | 3 | 8 | | 6 | 2 | 7 |
| Permitted Phases | | | | 4 | | 6 | | 6 | |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 11.0 | 24.0 | 25.2 | 25.2 | 25.2 | 25.2 | 11.0 |
| Total Split (s) | 47.0 | 47.0 | 24.0 | 46.0 | 39.0 | 39.0 | 39.0 | 39.0 | 25.0 |
| Total Split (%) | 42.7% | 42.7% | 21.8% | 41.8% | 35.5% | 35.5% | 35.5% | 35% | 23% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.7 | 1.7 | 1.7 | 1.7 | 2.9 | 2.9 | 2.9 | 2.9 | 1.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 7.2 | 7.2 | 7.2 | | |
| Lead/Lag | Lag | Lag | Lead | Lead | | | | Lag | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | C-Max | None |
| Act Effect Green (s) | 43.1 | 43.1 | 15.9 | 40.0 | 31.8 | 31.8 | 31.8 | | |
| Actuated g/C Ratio | 0.39 | 0.39 | 0.14 | 0.36 | 0.29 | 0.29 | 0.29 | | |
| v/c Ratio | 0.51 | 0.54 | 0.71 | 1.18 | 0.30 | 0.31 | 0.55 | | |
| Control Delay | 26.4 | 4.6 | 48.2 | 104.0 | 32.6 | 32.6 | 4.7 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 26.4 | 4.6 | 48.2 | 104.0 | 32.6 | 32.6 | 4.7 | | |
| LOS | C | A | D | F | C | C | A | | |
| Approach Delay | 21.1 | | | 96.2 | | 12.9 | | | |
| Approach LOS | C | | | F | | B | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 54.0

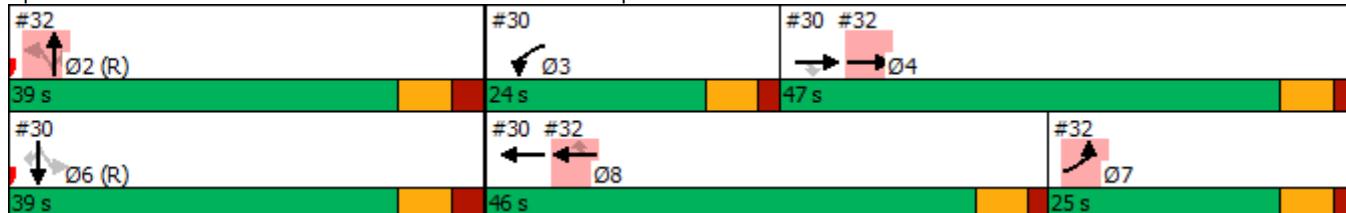
Intersection LOS: D

Intersection Capacity Utilization 103.2%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 30: Union Hills Dr & SR 101L SB Off Ramp



Timings

32: SR 101L NB Off Ramp & Union Hills Dr

04/10/2019



| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | NBR | Ø3 | Ø6 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑↑↑ | ↑ | ↑ | ↑↑ | ↑ | | |
| Traffic Volume (vph) | 660 | 1020 | 1380 | 280 | 990 | 0 | 230 | | |
| Future Volume (vph) | 660 | 1020 | 1380 | 280 | 990 | 0 | 230 | | |
| Turn Type | Prot | NA | NA | Perm | Perm | NA | Perm | | |
| Protected Phases | 7 | 4 | 8 | | | 2 | | 3 | 6 |
| Permitted Phases | | | | 8 | 2 | | 2 | | |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 | 2 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.0 | 24.0 | 24.0 | 24.0 | 25.2 | 25.2 | 25.2 | 11.0 | 25.2 |
| Total Split (s) | 25.0 | 47.0 | 46.0 | 46.0 | 39.0 | 39.0 | 39.0 | 24.0 | 39.0 |
| Total Split (%) | 22.7% | 42.7% | 41.8% | 41.8% | 35.5% | 35.5% | 35.5% | 22% | 35% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.7 | 1.7 | 1.7 | 1.7 | 2.9 | 2.9 | 2.9 | 1.7 | 2.9 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 7.2 | 7.2 | 7.2 | | |
| Lead/Lag | Lag | Lag | Lead | Lead | | | | Lead | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | Yes | |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | None | C-Max |
| Act Effect Green (s) | 19.0 | 43.1 | 40.0 | 40.0 | 31.8 | 31.8 | 31.8 | | |
| Actuated g/C Ratio | 0.17 | 0.39 | 0.36 | 0.36 | 0.29 | 0.29 | 0.29 | | |
| v/c Ratio | 1.19 | 0.55 | 0.54 | 0.39 | 1.10 | 1.10 | 0.40 | | |
| Control Delay | 127.5 | 12.9 | 28.5 | 4.3 | 107.7 | 107.7 | 6.9 | | |
| Queue Delay | 0.0 | 0.0 | 0.3 | 0.0 | 0.8 | 0.8 | 0.0 | | |
| Total Delay | 127.5 | 12.9 | 28.8 | 4.3 | 108.6 | 108.6 | 6.9 | | |
| LOS | F | B | C | A | F | F | A | | |
| Approach Delay | | 57.9 | 24.7 | | | 89.4 | | | |
| Approach LOS | | E | C | | | F | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 54.3

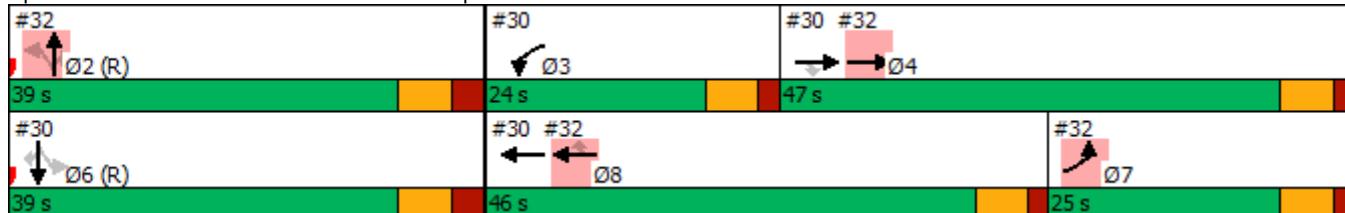
Intersection LOS: D

Intersection Capacity Utilization 103.2%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 32: SR 101L NB Off Ramp & Union Hills Dr



Timings

40: SR 101L WB Off Ramp & 75th Ave

04/10/2019



| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR | Ø1 | Ø4 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑ ↘ | ↑↑ ↗ | ↑ ↘ | ↑ ↘ | ↑↑ | ↑↑↑ | ↑ | | |
| Traffic Volume (vph) | 760 | 154 | 1010 | 210 | 1150 | 1130 | 360 | | |
| Future Volume (vph) | 760 | 154 | 1010 | 210 | 1150 | 1130 | 360 | | |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm | | |
| Protected Phases | | | | 8 | 5 | 2 | 6 | 1 | 4 |
| Permitted Phases | 8 | | | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.6 | 24.6 | 24.6 | 11.3 | 24.3 | 23.7 | 23.7 | 11.1 | 24.4 |
| Total Split (s) | 38.0 | 38.0 | 38.0 | 21.5 | 42.0 | 50.5 | 50.5 | 30.0 | 38.0 |
| Total Split (%) | 34.5% | 34.5% | 34.5% | 19.5% | 38.2% | 45.9% | 45.9% | 27% | 35% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.3 | 2.3 | 2.3 | 2.0 | 2.0 | 1.4 | 1.4 | 1.8 | 2.1 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.6 | 6.6 | 6.6 | 6.3 | 6.3 | 5.7 | 5.7 | | |
| Lead/Lag | | | | Lag | Lag | Lead | Lead | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | None | None |
| Act Effect Green (s) | 31.4 | 31.4 | 31.4 | 15.2 | 35.7 | 44.8 | 44.8 | | |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.29 | 0.14 | 0.32 | 0.41 | 0.41 | | |
| v/c Ratio | 1.17 | 0.98 | 0.72 | 0.93 | 1.09 | 0.47 | 0.45 | | |
| Control Delay | 134.0 | 52.7 | 11.3 | 81.2 | 83.5 | 24.6 | 4.1 | | |
| Queue Delay | 0.0 | 1.7 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | | |
| Total Delay | 134.0 | 54.3 | 11.3 | 81.2 | 83.5 | 24.7 | 4.1 | | |
| LOS | F | D | B | F | F | C | A | | |
| Approach Delay | | 63.5 | | | 83.2 | 19.7 | | | |
| Approach LOS | | E | | | F | B | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 55.4

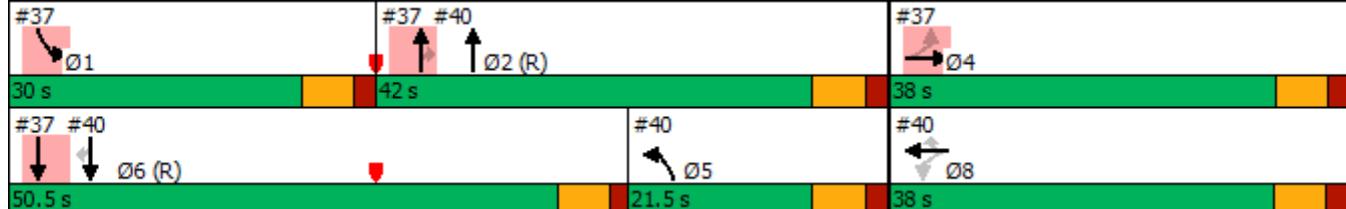
Intersection LOS: E

Intersection Capacity Utilization 119.6%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 40: SR 101L WB Off Ramp & 75th Ave



Timings

37: 75th Ave & SR 101L EB Off Ramp

04/10/2019



| Lane Group | EBL | EBT | NBT | NBR | SBL | SBT | Ø5 | Ø8 |
|----------------------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑ ↘ | ↔ ↔ | ↑↑↑ | ↑ | ↑ ↘ | ↔ ↔ | | |
| Traffic Volume (vph) | 560 | 37 | 800 | 610 | 820 | 1070 | | |
| Future Volume (vph) | 560 | 37 | 800 | 610 | 820 | 1070 | | |
| Turn Type | Perm | NA | NA | Perm | Prot | NA | | |
| Protected Phases | | 4 | 2 | | 1 | 6 | 5 | 8 |
| Permitted Phases | 4 | | | 2 | | | | |
| Detector Phase | 4 | 4 | 2 | 2 | 1 | 6 | | |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.4 | 24.4 | 24.3 | 24.3 | 11.1 | 23.7 | 11.3 | 24.6 |
| Total Split (s) | 38.0 | 38.0 | 42.0 | 42.0 | 30.0 | 50.5 | 21.5 | 38.0 |
| Total Split (%) | 34.5% | 34.5% | 38.2% | 38.2% | 27.3% | 45.9% | 20% | 35% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.1 | 2.1 | 2.0 | 2.0 | 1.8 | 1.4 | 2.0 | 2.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.4 | 6.4 | 6.3 | 6.3 | 6.1 | 5.7 | | |
| Lead/Lag | | | Lag | Lag | Lead | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | C-Max | C-Max | None | C-Max | None | None |
| Act Effect Green (s) | 31.6 | 31.6 | 35.7 | 35.7 | 23.9 | 44.8 | | |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.32 | 0.32 | 0.22 | 0.41 | | |
| v/c Ratio | 0.66 | 0.44 | 0.53 | 0.77 | 1.20 | 0.81 | | |
| Control Delay | 42.4 | 32.2 | 31.7 | 13.9 | 124.1 | 19.2 | | |
| Queue Delay | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.1 | | |
| Total Delay | 42.4 | 32.2 | 32.1 | 13.9 | 124.1 | 19.3 | | |
| LOS | D | C | C | B | F | B | | |
| Approach Delay | | 36.6 | 24.2 | | | 64.8 | | |
| Approach LOS | D | C | | | E | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 45.6

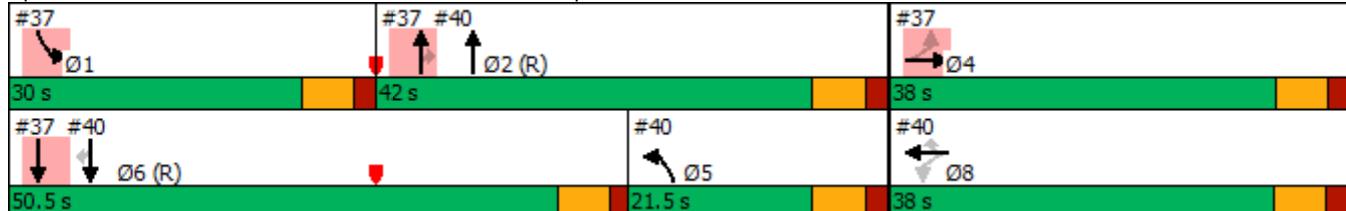
Intersection LOS: D

Intersection Capacity Utilization 119.6%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 37: 75th Ave & SR 101L EB Off Ramp



Timings

48: SR 101L WB Off Ramp & 67th Ave

04/10/2019



| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR | Ø1 | Ø4 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑ ↗ | ↗ ↗ | ↗ | ↑ ↗ | ↑ ↗ | ↑↑↑ | ↑ | | |
| Traffic Volume (vph) | 870 | 647 | 750 | 360 | 1300 | 1140 | 380 | | |
| Future Volume (vph) | 870 | 647 | 750 | 360 | 1300 | 1140 | 380 | | |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm | | |
| Protected Phases | | | | 8 | 5 | 2 | 6 | 1 | 4 |
| Permitted Phases | 8 | | | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.3 | 24.3 | 24.3 | 11.0 | 24.0 | 23.9 | 23.9 | 10.9 | 24.4 |
| Total Split (s) | 42.0 | 42.0 | 42.0 | 24.0 | 44.0 | 44.0 | 44.0 | 24.0 | 42.0 |
| Total Split (%) | 38.2% | 38.2% | 38.2% | 21.8% | 40.0% | 40.0% | 40.0% | 22% | 38% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.7 | 1.7 | 1.6 | 1.6 | 1.6 | 2.1 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.0 | 6.0 | 5.9 | 5.9 | | |
| Lead/Lag | | | | | Lag | Lead | Lead | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | C-Max | C-Max | C-Max | Max | Max |
| Act Effect Green (s) | 35.7 | 35.7 | 35.7 | 18.0 | 38.0 | 38.1 | 38.1 | | |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.16 | 0.35 | 0.35 | 0.35 | | |
| v/c Ratio | 1.21 | 1.25 | 0.80 | 1.35 | 1.16 | 0.56 | 0.68 | | |
| Control Delay | 147.3 | 154.3 | 21.8 | 213.6 | 100.2 | 30.3 | 30.0 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | | |
| Total Delay | 147.3 | 154.3 | 21.8 | 213.6 | 100.2 | 30.7 | 30.0 | | |
| LOS | F | F | C | F | F | C | C | | |
| Approach Delay | | 122.2 | | | 124.7 | 30.5 | | | |
| Approach LOS | | F | | | F | C | | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.35

Intersection Signal Delay: 97.4

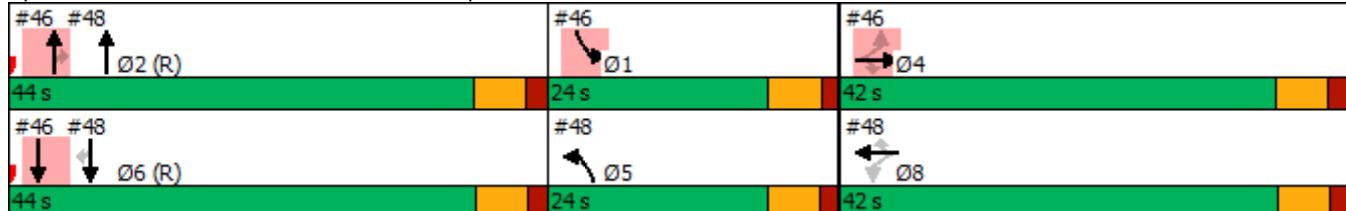
Intersection LOS: F

Intersection Capacity Utilization 115.4%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 48: SR 101L WB Off Ramp & 67th Ave



Timings

46: 67th Ave & SR 101L EB Off Ramp

04/10/2019



| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT | Ø5 | Ø8 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Lane Configurations | ↑ ↗ | ↔ ↔ | ↗ | ↑ ↑ ↑ | ↗ | ↗ ↗ | ↑ ↑ | | |
| Traffic Volume (vph) | 720 | 239 | 230 | 940 | 540 | 670 | 1340 | | |
| Future Volume (vph) | 720 | 239 | 230 | 940 | 540 | 670 | 1340 | | |
| Turn Type | Perm | NA | Perm | NA | Perm | Prot | NA | | |
| Protected Phases | | | | 4 | 2 | | 1 | 6 | 5 8 |
| Permitted Phases | 4 | | | | 4 | 2 | | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 | | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.4 | 24.4 | 24.4 | 24.0 | 24.0 | 10.9 | 23.9 | 11.0 | 24.3 |
| Total Split (s) | 42.0 | 42.0 | 42.0 | 44.0 | 44.0 | 24.0 | 44.0 | 24.0 | 42.0 |
| Total Split (%) | 38.2% | 38.2% | 38.2% | 40.0% | 40.0% | 21.8% | 40.0% | 22% | 38% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 1.7 | 1.7 | 1.6 | 1.6 | 1.7 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.4 | 6.4 | 6.4 | 6.0 | 6.0 | 5.9 | 5.9 | | |
| Lead/Lag | | | | Lead | Lead | Lag | Lead | Lag | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes | Yes | |
| Recall Mode | Max | Max | Max | C-Max | C-Max | Max | C-Max | None | None |
| Act Effect Green (s) | 35.6 | 35.6 | 35.6 | 38.0 | 38.0 | 18.1 | 38.1 | | |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.35 | 0.35 | 0.16 | 0.35 | | |
| v/c Ratio | 0.75 | 0.67 | 0.36 | 0.58 | 0.82 | 1.29 | 1.19 | | |
| Control Delay | 43.7 | 36.1 | 5.4 | 31.1 | 29.0 | 176.3 | 110.9 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | | |
| Total Delay | 43.7 | 36.1 | 5.4 | 31.9 | 29.0 | 176.3 | 110.9 | | |
| LOS | D | D | A | C | C | F | F | | |
| Approach Delay | | 33.0 | | | 30.9 | | 132.7 | | |
| Approach LOS | | C | | | C | | F | | |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.35

Intersection Signal Delay: 75.1

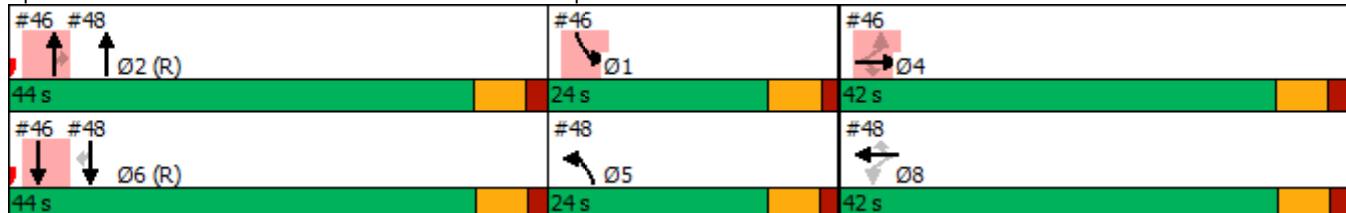
Intersection LOS: E

Intersection Capacity Utilization 115.4%

ICU Level of Service H

Analysis Period (min) 15

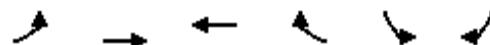
Splits and Phases: 46: 67th Ave & SR 101L EB Off Ramp



Timings

3: Bell Rd & 92nd Ave

02/26/2019



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↗ | ↑↑↑ | ↑↑↑ | ↗ | ↖ | ↗ |
| Traffic Volume (vph) | 10 | 1609 | 2163 | 248 | 296 | 16 |
| Future Volume (vph) | 10 | 1609 | 2163 | 248 | 296 | 16 |
| Turn Type | pm+pt | NA | NA | Perm | Perm | Perm |
| Protected Phases | 7 | 4 | 8 | | | |
| Permitted Phases | 4 | | | 8 | 6 | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.8 | 24.1 | 24.1 | 24.1 | 23.6 | 23.6 |
| Total Split (s) | 10.8 | 82.0 | 71.2 | 71.2 | 38.0 | 38.0 |
| Total Split (%) | 9.0% | 68.3% | 59.3% | 59.3% | 31.7% | 31.7% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.5 | 1.5 | 1.5 | 1.5 | 1.3 | 1.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.6 | 5.6 |
| Lead/Lag | Lag | | Lead | Lead | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |
| Act Effect Green (s) | 76.2 | 76.2 | 74.0 | 74.0 | 32.4 | 32.4 |
| Actuated g/C Ratio | 0.64 | 0.64 | 0.62 | 0.62 | 0.27 | 0.27 |
| v/c Ratio | 0.08 | 0.54 | 0.75 | 0.25 | 0.68 | 0.04 |
| Control Delay | 12.2 | 13.0 | 4.2 | 0.2 | 47.3 | 13.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.2 | 13.0 | 4.2 | 0.2 | 47.3 | 13.9 |
| LOS | B | B | A | A | D | B |
| Approach Delay | | 13.0 | 3.8 | | 45.6 | |
| Approach LOS | | B | A | | D | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 112 (93%), Referenced to phase 4:EBTL and 8:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 10.2

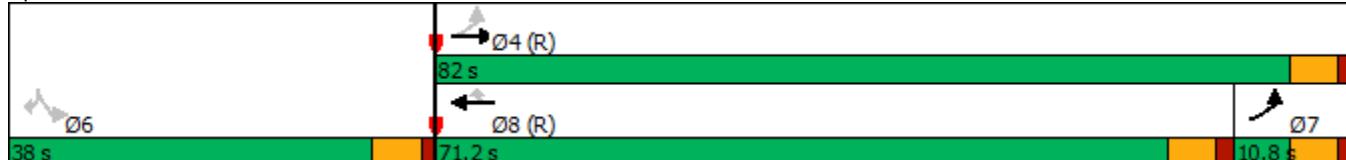
Intersection LOS: B

Intersection Capacity Utilization 67.7%

ICU Level of Service C

Analysis Period (min) 15

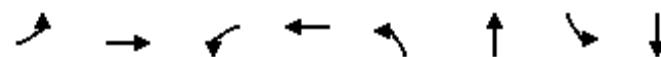
Splits and Phases: 3: Bell Rd & 92nd Ave



Timings

7: Bell Rd & 91st Ave

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ |
| Traffic Volume (vph) | 210 | 1620 | 200 | 1910 | 80 | 300 | 260 | 300 |
| Future Volume (vph) | 210 | 1620 | 200 | 1910 | 80 | 300 | 260 | 300 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | pm+pt | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | 4 | | | 8 | | 2 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.2 | 24.2 | 11.2 | 24.2 | 10.7 | 23.7 | 10.6 | 23.6 |
| Total Split (s) | 18.0 | 55.4 | 20.2 | 57.6 | 12.7 | 23.8 | 20.6 | 31.7 |
| Total Split (%) | 15.0% | 46.2% | 16.8% | 48.0% | 10.6% | 19.8% | 17.2% | 26.4% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.9 | 1.9 | 1.9 | 1.9 | 1.4 | 1.4 | 1.3 | 1.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 | 5.6 | 5.6 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | None | Max |
| Act Effect Green (s) | 49.8 | 49.8 | 51.4 | 51.4 | 25.0 | 18.1 | 38.8 | 26.2 |
| Actuated g/C Ratio | 0.42 | 0.42 | 0.43 | 0.43 | 0.21 | 0.15 | 0.32 | 0.22 |
| v/c Ratio | 0.97 | 0.86 | 0.83 | 1.07 | 0.39 | 0.90 | 1.00 | 0.61 |
| Control Delay | 84.3 | 26.5 | 54.8 | 74.2 | 35.6 | 61.8 | 89.1 | 40.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 84.3 | 26.5 | 54.8 | 74.2 | 35.6 | 61.8 | 89.1 | 40.9 |
| LOS | F | C | D | E | D | E | F | D |
| Approach Delay | | 33.0 | | 72.5 | | 58.0 | | 58.8 |
| Approach LOS | | C | | E | | E | | E |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 55.7

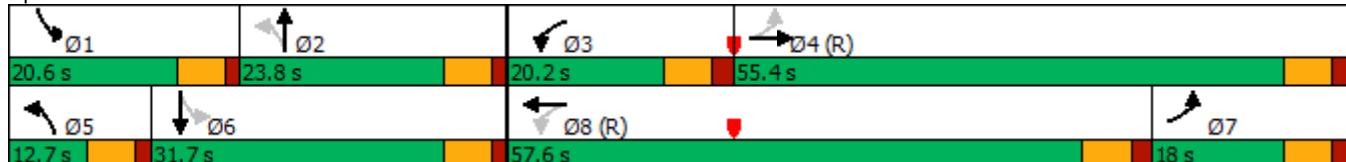
Intersection LOS: E

Intersection Capacity Utilization 101.4%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 7: Bell Rd & 91st Ave



Timings

12: 87th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-----------|-------------|-------|---------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ ↗ ↘ ↗ ↘ | ↑↑↑ ↗ ↘ ↗ ↘ | ↑ ↗ ↘ | ↑↑↑ ↗ ↘ | ↑ ↗ ↘ | ↑ ↗ ↘ | ↑ ↗ ↘ | ↑ ↗ ↘ | ↑ ↗ ↘ | ↑ ↗ ↘ | ↑ ↗ ↘ |
| Traffic Volume (vph) | 50 | 1980 | 160 | 2740 | 80 | 110 | 40 | 130 | 70 | 50 | 70 |
| Future Volume (vph) | 50 | 1980 | 160 | 2740 | 80 | 110 | 40 | 130 | 70 | 50 | 70 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | 2 | | 2 | 6 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.3 | 24.3 | 11.3 | 24.3 | 24.3 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 |
| Total Split (s) | 11.3 | 72.7 | 23.3 | 84.7 | 84.7 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| Total Split (%) | 9.4% | 60.6% | 19.4% | 70.6% | 70.6% | 20.0% | 20.0% | 20.0% | 20.0% | 20.0% | 20.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 76.1 | 71.1 | 89.4 | 80.7 | 80.7 | 18.3 | 18.3 | 18.3 | 18.3 | 18.3 | 18.3 |
| Actuated g/C Ratio | 0.63 | 0.59 | 0.74 | 0.67 | 0.67 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| v/c Ratio | 0.40 | 0.73 | 0.72 | 0.87 | 0.08 | 0.59 | 0.15 | 0.39 | 0.37 | 0.19 | 0.21 |
| Control Delay | 20.9 | 20.0 | 42.6 | 20.0 | 2.0 | 59.9 | 45.8 | 10.1 | 51.5 | 46.4 | 1.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 20.9 | 20.0 | 42.6 | 20.0 | 2.0 | 59.9 | 45.8 | 10.1 | 51.5 | 46.4 | 1.3 |
| LOS | C | C | D | C | A | E | D | B | D | D | A |
| Approach Delay | | 20.0 | | 20.8 | | | 34.8 | | | 31.6 | |
| Approach LOS | | C | | C | | | C | | | C | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 21.6

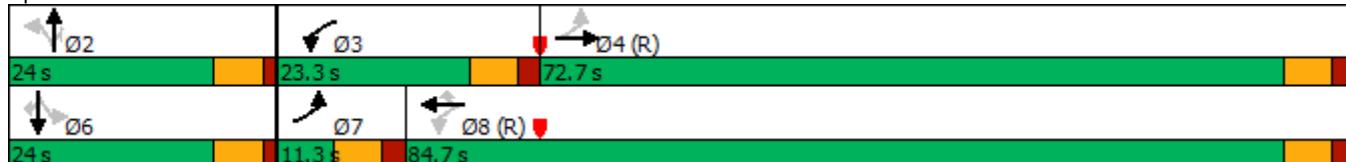
Intersection LOS: C

Intersection Capacity Utilization 85.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 12: 87th Ave & Bell Rd



Timings

17: 84th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ |
| Traffic Volume (vph) | 4 | 2172 | 233 | 2679 | 120 | 19 | 1 | 228 | 1 |
| Future Volume (vph) | 4 | 2172 | 233 | 2679 | 120 | 19 | 1 | 228 | 1 |
| Turn Type | Prot | NA | Prot | NA | Perm | pm+pt | NA | pm+pt | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.7 | 23.7 | 10.7 | 23.7 | 23.7 | 11.5 | 24.5 | 11.5 | 24.5 |
| Total Split (s) | 10.7 | 58.5 | 21.0 | 68.8 | 68.8 | 11.5 | 24.5 | 16.0 | 29.0 |
| Total Split (%) | 8.9% | 48.8% | 17.5% | 57.3% | 57.3% | 9.6% | 20.4% | 13.3% | 24.2% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 2.2 | 2.2 | 2.2 | 2.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lead | Lag | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | C-Max | None | Max | None | Max |
| Act Effect Green (s) | 5.0 | 52.8 | 15.3 | 71.7 | 71.7 | 23.0 | 18.0 | 33.2 | 29.4 |
| Actuated g/C Ratio | 0.04 | 0.44 | 0.13 | 0.60 | 0.60 | 0.19 | 0.15 | 0.28 | 0.24 |
| v/c Ratio | 0.05 | 1.06 | 1.12 | 0.96 | 0.13 | 0.07 | 0.96 | 1.30 | 0.03 |
| Control Delay | 57.0 | 70.7 | 145.0 | 32.7 | 2.0 | 32.5 | 54.1 | 198.4 | 19.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 57.0 | 70.7 | 145.0 | 32.7 | 2.0 | 32.5 | 54.1 | 198.4 | 19.8 |
| LOS | E | E | F | C | A | C | D | F | B |
| Approach Delay | | 70.7 | | 40.1 | | | 53.1 | | 189.5 |
| Approach LOS | | E | | D | | | D | | F |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.30

Intersection Signal Delay: 58.5

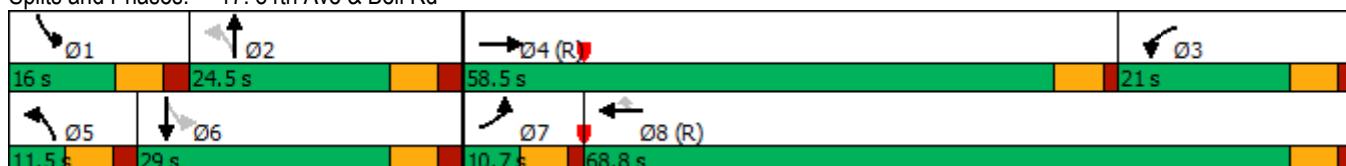
Intersection LOS: E

Intersection Capacity Utilization 113.5%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 17: 84th Ave & Bell Rd



Timings

11: 83rd Ave & Bell Rd

02/25/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↓ | ↑↑↑↓ | ↑↓ | ↑↑↑↓ | ↑↓ | ↑↑ | ↑↓ | ↑↓ | ↑↑↑ | ↑ |
| Traffic Volume (vph) | 490 | 1600 | 240 | 1990 | 440 | 680 | 240 | 250 | 630 | 480 |
| Future Volume (vph) | 490 | 1600 | 240 | 1990 | 440 | 680 | 240 | 250 | 630 | 480 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.9 | 24.9 | 11.9 | 24.9 | 12.2 | 25.2 | 25.2 | 12.1 | 25.1 | 25.1 |
| Total Split (s) | 22.0 | 49.6 | 17.4 | 45.0 | 20.0 | 36.2 | 36.2 | 16.8 | 33.0 | 33.0 |
| Total Split (%) | 18.3% | 41.3% | 14.5% | 37.5% | 16.7% | 30.2% | 30.2% | 14.0% | 27.5% | 27.5% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.6 | 2.6 | 2.6 | 2.6 | 2.9 | 2.9 | 2.9 | 2.8 | 2.8 | 2.8 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 6.9 | 7.2 | 7.2 | 7.2 | 7.1 | 7.1 | 7.1 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |
| Act Effect Green (s) | 15.1 | 42.7 | 10.5 | 38.1 | 12.8 | 29.0 | 29.0 | 9.7 | 25.9 | 25.9 |
| Actuated g/C Ratio | 0.13 | 0.36 | 0.09 | 0.32 | 0.11 | 0.24 | 0.24 | 0.08 | 0.22 | 0.22 |
| v/c Ratio | 1.24 | 0.92 | 0.87 | 1.27 | 1.31 | 0.86 | 0.30 | 0.98 | 0.62 | 1.05 |
| Control Delay | 172.6 | 29.0 | 81.7 | 162.2 | 198.4 | 55.3 | 5.2 | 104.9 | 45.6 | 83.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 172.6 | 29.0 | 81.7 | 162.2 | 198.4 | 55.3 | 5.2 | 104.9 | 45.6 | 83.7 |
| LOS | F | C | F | F | F | E | A | F | D | F |
| Approach Delay | | 58.5 | | 154.8 | | 92.8 | | | 69.9 | |
| Approach LOS | | E | | F | | F | | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 69 (58%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.31

Intersection Signal Delay: 99.0

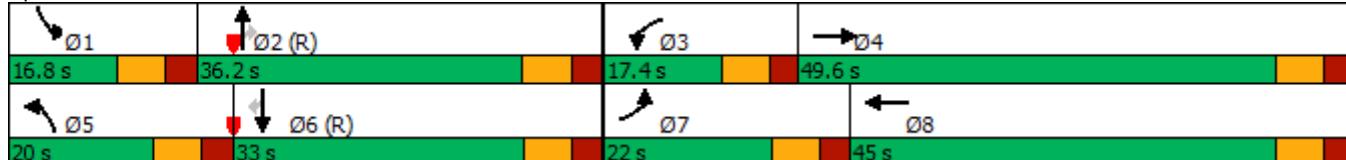
Intersection LOS: F

Intersection Capacity Utilization 98.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 11: 83rd Ave & Bell Rd



Timings

27: 79th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↖ | ↑↑↑↖ | ↑↖ | ↑↑↑↖ | ↑↖ | ↑↖ | ↑↖ | ↑↖ | ↑↑↑↖ | ↑↖ |
| Traffic Volume (vph) | 350 | 1660 | 120 | 1970 | 170 | 100 | 90 | 330 | 100 | 200 |
| Future Volume (vph) | 350 | 1660 | 120 | 1970 | 170 | 100 | 90 | 330 | 100 | 200 |
| Turn Type | Prot | NA | Prot | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | 2 | | 2 | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.9 | 24.9 | 11.7 | 24.7 | 11.6 | 24.6 | 24.6 | 11.4 | 24.4 | 24.4 |
| Total Split (s) | 20.4 | 53.8 | 15.6 | 49.0 | 21.2 | 24.6 | 24.6 | 26.0 | 29.4 | 29.4 |
| Total Split (%) | 17.0% | 44.8% | 13.0% | 40.8% | 17.7% | 20.5% | 20.5% | 21.7% | 24.5% | 24.5% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.6 | 2.6 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.1 | 2.1 | 2.1 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.9 | 6.9 | 6.7 | 6.7 | 6.6 | 6.6 | 6.6 | 6.4 | 6.4 | 6.4 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 13.5 | 47.3 | 8.5 | 42.3 | 31.6 | 18.6 | 18.6 | 43.3 | 24.5 | 24.5 |
| Actuated g/C Ratio | 0.11 | 0.39 | 0.07 | 0.35 | 0.26 | 0.16 | 0.16 | 0.36 | 0.20 | 0.20 |
| v/c Ratio | 0.98 | 0.76 | 0.53 | 1.08 | 0.48 | 0.38 | 0.23 | 0.75 | 0.15 | 0.44 |
| Control Delay | 95.4 | 33.7 | 65.0 | 54.9 | 32.1 | 50.3 | 1.2 | 41.7 | 40.5 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 95.4 | 33.7 | 65.0 | 54.9 | 32.1 | 50.3 | 1.2 | 41.7 | 40.5 | 8.4 |
| LOS | F | C | E | D | C | D | A | D | D | A |
| Approach Delay | | 44.0 | | 55.4 | | 29.5 | | | 31.0 | |
| Approach LOS | | D | | E | | C | | | C | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 56 (47%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 46.4

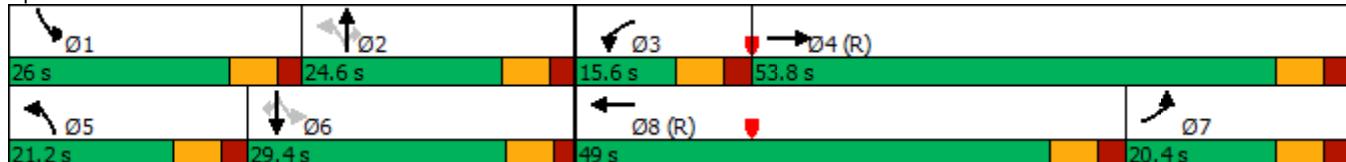
Intersection LOS: D

Intersection Capacity Utilization 84.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 27: 79th Ave & Bell Rd





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑ |
| Traffic Volume (vph) | 190 | 1890 | 120 | 2080 | 90 | 50 | 270 | 50 | 200 |
| Future Volume (vph) | 190 | 1890 | 120 | 2080 | 90 | 50 | 270 | 50 | 200 |
| Turn Type | Prot | NA | Prot | NA | pm+pt | NA | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | 2 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.7 | 24.7 | 11.6 | 24.6 | 11.6 | 24.6 | 11.6 | 24.6 | 24.6 |
| Total Split (s) | 16.0 | 59.8 | 15.6 | 59.4 | 13.4 | 24.6 | 20.0 | 31.2 | 31.2 |
| Total Split (%) | 13.3% | 49.8% | 13.0% | 49.5% | 11.2% | 20.5% | 16.7% | 26.0% | 26.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.7 | 6.7 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 |
| Lead/Lag | Lead | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | None | Max | None | Max | Max |
| Act Effect Green (s) | 9.3 | 53.1 | 9.0 | 52.8 | 24.8 | 18.0 | 38.0 | 24.6 | 24.6 |
| Actuated g/C Ratio | 0.08 | 0.44 | 0.08 | 0.44 | 0.21 | 0.15 | 0.32 | 0.20 | 0.20 |
| v/c Ratio | 0.78 | 0.74 | 0.51 | 0.92 | 0.32 | 0.25 | 0.77 | 0.14 | 0.44 |
| Control Delay | 56.2 | 19.9 | 33.3 | 11.8 | 34.5 | 20.1 | 49.0 | 40.3 | 8.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 56.2 | 19.9 | 33.3 | 11.8 | 34.5 | 20.1 | 49.0 | 40.3 | 8.2 |
| LOS | E | B | C | B | C | C | D | D | A |
| Approach Delay | | 23.2 | | | 12.9 | | 26.0 | | 32.5 |
| Approach LOS | | C | | | B | | C | | C |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 19.4

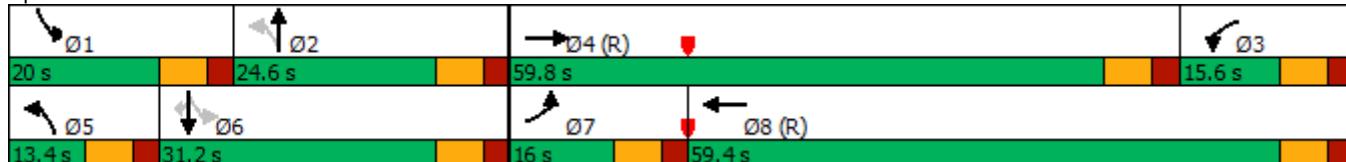
Intersection LOS: B

Intersection Capacity Utilization 81.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 32: 77th Ave



Timings

37: 75th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑↑ | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑ | ↑ | ↑↑ | ↑↑↑ | ↑ |
| Traffic Volume (vph) | 370 | 1660 | 300 | 2670 | 260 | 260 | 470 | 120 | 250 | 630 | 190 |
| Future Volume (vph) | 370 | 1660 | 300 | 2670 | 260 | 260 | 470 | 120 | 250 | 630 | 190 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 12.3 | 25.3 | 12.2 | 25.2 | 25.2 | 11.4 | 24.4 | 24.4 | 11.3 | 24.3 | 24.3 |
| Total Split (s) | 19.0 | 58.7 | 22.0 | 61.7 | 61.7 | 15.0 | 25.3 | 25.3 | 14.0 | 24.3 | 24.3 |
| Total Split (%) | 15.8% | 48.9% | 18.3% | 51.4% | 51.4% | 12.5% | 21.1% | 21.1% | 11.7% | 20.3% | 20.3% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 3.0 | 3.0 | 2.9 | 2.9 | 2.9 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.3 | 7.3 | 7.2 | 7.2 | 7.2 | 6.4 | 6.4 | 6.4 | 6.3 | 6.3 | 6.3 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 11.7 | 51.9 | 14.3 | 54.5 | 54.5 | 8.6 | 18.9 | 18.9 | 7.7 | 18.0 | 18.0 |
| Actuated g/C Ratio | 0.10 | 0.43 | 0.12 | 0.45 | 0.45 | 0.07 | 0.16 | 0.16 | 0.06 | 0.15 | 0.15 |
| v/c Ratio | 1.20 | 0.78 | 0.80 | 1.26 | 0.34 | 1.15 | 0.92 | 0.30 | 1.24 | 0.90 | 0.48 |
| Control Delay | 142.1 | 13.8 | 66.3 | 149.7 | 6.8 | 153.0 | 72.5 | 1.7 | 185.1 | 66.0 | 8.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 142.1 | 13.8 | 66.3 | 149.7 | 6.8 | 153.0 | 72.5 | 1.7 | 185.1 | 66.0 | 8.2 |
| LOS | F | B | E | F | A | F | E | A | F | E | A |
| Approach Delay | | 34.2 | | 130.5 | | | 87.2 | | | 83.5 | |
| Approach LOS | | C | | F | | | F | | | F | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 117 (98%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.26

Intersection Signal Delay: 88.9

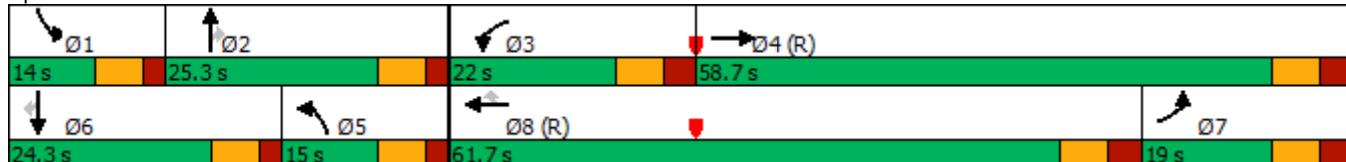
Intersection LOS: F

Intersection Capacity Utilization 104.9%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 37: 75th Ave & Bell Rd



Timings

42: 73rd Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ | ↑ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ ↖ ↗ ↘ |
| Traffic Volume (vph) | 30 | 1955 | 147 | 2869 | 198 | 21 | 2 | 98 | 164 | 2 | 35 |
| Future Volume (vph) | 30 | 1955 | 147 | 2869 | 198 | 21 | 2 | 98 | 164 | 2 | 35 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.3 | 24.3 | 11.3 | 24.3 | 24.3 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 |
| Total Split (s) | 11.3 | 73.0 | 22.0 | 83.7 | 83.7 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| Total Split (%) | 9.4% | 60.8% | 18.3% | 69.8% | 69.8% | 20.8% | 20.8% | 20.8% | 20.8% | 20.8% | 20.8% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 75.9 | 70.9 | 88.7 | 81.9 | 81.9 | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 |
| Actuated g/C Ratio | 0.63 | 0.59 | 0.74 | 0.68 | 0.68 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| v/c Ratio | 0.24 | 0.72 | 0.69 | 0.90 | 0.19 | 0.11 | 0.01 | 0.29 | 0.82 | 0.01 | 0.10 |
| Control Delay | 11.0 | 19.6 | 40.4 | 21.3 | 4.2 | 45.3 | 43.0 | 4.9 | 78.7 | 43.0 | 0.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.0 | 19.6 | 40.4 | 21.3 | 4.2 | 45.3 | 43.0 | 4.9 | 78.7 | 43.0 | 0.6 |
| LOS | B | B | D | C | A | D | D | A | E | D | A |
| Approach Delay | | 19.5 | | 21.2 | | | 12.5 | | | 64.8 | |
| Approach LOS | | B | | C | | | B | | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 21.9

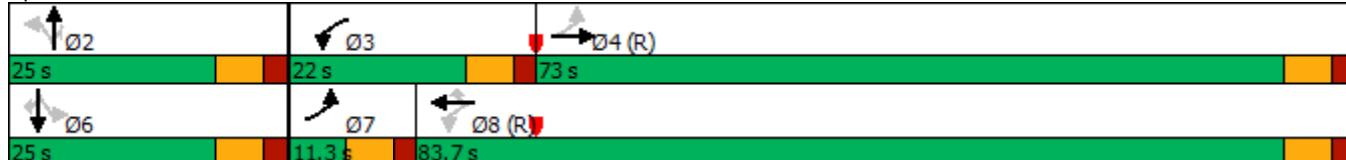
Intersection LOS: C

Intersection Capacity Utilization 91.4%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 42: 73rd Ave & Bell Rd



Timings

47: 69th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | ↑ | ↑ | ↑↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 35 | 2157 | 25 | 144 | 3144 | 26 | 2 | 104 | 175 | 2 | 44 |
| Future Volume (vph) | 35 | 2157 | 25 | 144 | 3144 | 26 | 2 | 104 | 175 | 2 | 44 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 2 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 10.9 | 23.9 | 23.9 | 10.9 | 23.9 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 |
| Total Split (s) | 11.0 | 74.0 | 74.0 | 21.4 | 84.4 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 |
| Total Split (%) | 9.2% | 61.7% | 61.7% | 17.8% | 70.3% | 20.5% | 20.5% | 20.5% | 20.5% | 20.5% | 20.5% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | Max | Max | Max | Max | Max | Max |
| Act Effect Green (s) | 77.4 | 72.3 | 72.3 | 89.5 | 82.9 | 18.3 | 18.3 | 18.3 | 18.3 | 18.3 | 18.3 |
| Actuated g/C Ratio | 0.64 | 0.60 | 0.60 | 0.75 | 0.69 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| v/c Ratio | 0.28 | 0.77 | 0.03 | 0.69 | 1.04 | 0.13 | 0.01 | 0.32 | 0.88 | 0.01 | 0.14 |
| Control Delay | 12.1 | 20.2 | 0.0 | 40.3 | 47.7 | 45.8 | 43.5 | 7.4 | 87.8 | 43.5 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.1 | 20.2 | 0.0 | 40.3 | 47.7 | 45.8 | 43.5 | 7.4 | 87.8 | 43.5 | 0.8 |
| LOS | B | C | A | D | D | D | D | A | F | D | A |
| Approach Delay | | 19.9 | | | 47.4 | | 15.4 | | | 70.0 | |
| Approach LOS | | B | | | D | | B | | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 37.5

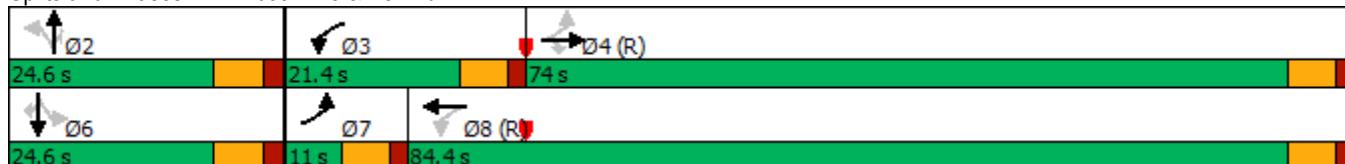
Intersection LOS: D

Intersection Capacity Utilization 100.8%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 47: 69th Ave & Bell Rd



Timings

52: 67th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | | ↑ | ↑↑↑ | | ↑ | ↑↑ | | ↑ | ↑↑↑ | ↑ |
| Traffic Volume (vph) | 270 | 1730 | 510 | 240 | 2570 | 270 | 810 | 1210 | 240 | 270 | 1190 | 250 |
| Future Volume (vph) | 270 | 1730 | 510 | 240 | 2570 | 270 | 810 | 1210 | 240 | 270 | 1190 | 250 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 12.0 | 25.0 | 25.0 | 12.0 | 25.0 | 25.0 | 11.1 | 24.1 | 24.1 | 10.9 | 23.9 | 23.9 |
| Total Split (s) | 14.0 | 52.0 | 52.0 | 14.0 | 52.0 | 52.0 | 24.0 | 41.0 | 41.0 | 13.0 | 30.0 | 30.0 |
| Total Split (%) | 11.7% | 43.3% | 43.3% | 11.7% | 43.3% | 43.3% | 20.0% | 34.2% | 34.2% | 10.8% | 25.0% | 25.0% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 1.8 | 1.8 | 1.8 | 1.6 | 1.6 | 1.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 6.1 | 6.1 | 6.1 | 5.9 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lead | Lead | Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 17.9 | 34.9 | 34.9 | 7.1 | 24.1 |
| Actuated g/C Ratio | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.15 | 0.29 | 0.29 | 0.06 | 0.20 | 0.20 |
| v/c Ratio | 1.78 | 0.99 | 0.64 | 1.58 | 1.47 | 0.41 | 1.72 | 1.28 | 0.43 | 1.44 | 1.27 | 0.55 |
| Control Delay | 395.8 | 55.0 | 10.8 | 321.9 | 242.8 | 10.5 | 363.5 | 168.9 | 9.5 | 264.9 | 167.6 | 14.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 395.8 | 55.0 | 10.8 | 321.9 | 242.8 | 10.5 | 363.5 | 168.9 | 9.5 | 264.9 | 167.6 | 14.6 |
| LOS | F | E | B | F | F | B | F | F | A | F | F | B |
| Approach Delay | | 82.7 | | | 228.6 | | | 221.7 | | | 160.5 | |
| Approach LOS | | F | | | F | | | F | | | F | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.78

Intersection Signal Delay: 176.5

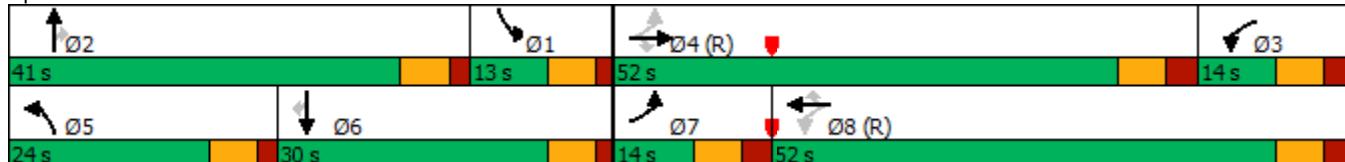
Intersection LOS: F

Intersection Capacity Utilization 132.4%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 52: 67th Ave & Bell Rd



Timings

57: 63rd Ave & Bell Rd

02/26/2019

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR | |
|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Lane Configurations | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ | ↑ ↗ ↘ ↖ ↙ ↛ ↜ ↚ ↗ ↘ ↖ |
| Traffic Volume (vph) | 224 | 1622 | 215 | 2272 | 217 | 13 | 101 | 221 | 45 | 474 | |
| Future Volume (vph) | 224 | 1622 | 215 | 2272 | 217 | 13 | 101 | 221 | 45 | 474 | |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | NA | Perm | Perm | NA | Perm | |
| Protected Phases | 7 | 4 | 3 | 8 | | 2 | | | 6 | | |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 2 | 2 | 2 | 6 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 10.8 | 23.8 | 10.8 | 23.8 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | 24.2 | |
| Total Split (s) | 19.2 | 64.1 | 22.5 | 67.4 | 33.4 | 33.4 | 33.4 | 33.4 | 33.4 | 33.4 | |
| Total Split (%) | 16.0% | 53.4% | 18.8% | 56.2% | 27.8% | 27.8% | 27.8% | 27.8% | 27.8% | 27.8% | |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | |
| All-Red Time (s) | 1.5 | 1.5 | 1.5 | 1.5 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 | 6.2 | |
| Lead/Lag | Lead | Lag | Lead | Lag | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | | | |
| Recall Mode | None | C-Max | None | C-Max | Max | Max | Max | Max | Max | Max | |
| Act Effect Green (s) | 73.4 | 60.1 | 76.6 | 61.7 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | |
| Actuated g/C Ratio | 0.61 | 0.50 | 0.64 | 0.51 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | |
| v/c Ratio | 0.94 | 0.85 | 0.83 | 1.01 | 0.77 | 0.03 | 0.25 | 0.76 | 0.12 | 1.00 | |
| Control Delay | 76.1 | 29.8 | 54.6 | 50.1 | 61.5 | 36.6 | 8.4 | 60.3 | 37.9 | 67.1 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 76.1 | 29.8 | 54.6 | 50.1 | 61.5 | 36.6 | 8.4 | 60.3 | 37.9 | 67.1 | |
| LOS | E | C | D | D | E | D | A | E | D | E | |
| Approach Delay | | 34.5 | | 50.4 | | 44.3 | | | 63.3 | | |
| Approach LOS | | C | | D | | D | | | E | | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 45.8

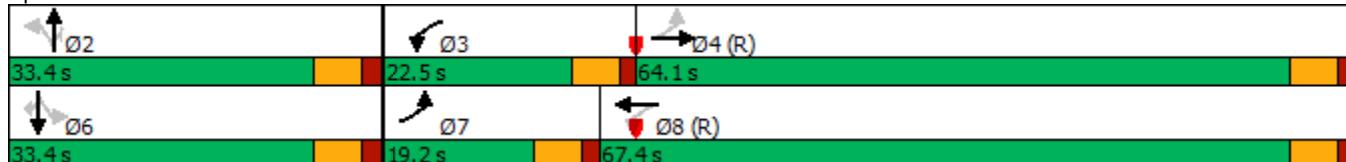
Intersection LOS: D

Intersection Capacity Utilization 103.7%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 57: 63rd Ave & Bell Rd



Timings

62: 59th Ave & Bell Rd

02/26/2019



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑ | ↑↑↑ | | ↑ | ↑↑↑ | | ↑ | ↑↑ | | ↑ | ↑↑ | |
| Traffic Volume (vph) | 260 | 1200 | 210 | 210 | 1640 | 270 | 400 | 850 | 220 | 230 | 650 | 230 |
| Future Volume (vph) | 260 | 1200 | 210 | 210 | 1640 | 270 | 400 | 850 | 220 | 230 | 650 | 230 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.4 | 24.4 | 24.4 | 11.6 | 24.6 | 24.6 | 10.9 | 23.9 | 23.9 | 11.0 | 24.0 | 24.0 |
| Total Split (s) | 18.0 | 46.6 | 46.6 | 19.4 | 48.0 | 48.0 | 22.0 | 34.0 | 34.0 | 20.0 | 32.0 | 32.0 |
| Total Split (%) | 15.0% | 38.8% | 38.8% | 16.2% | 40.0% | 40.0% | 18.3% | 28.3% | 28.3% | 16.7% | 26.7% | 26.7% |
| Yellow Time (s) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.3 | 2.3 | 2.3 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.4 | 6.4 | 6.4 | 6.6 | 6.6 | 6.6 | 5.9 | 5.9 | 5.9 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | Max | Max | None | Max | Max |
| Act Effect Green (s) | 51.8 | 40.2 | 40.2 | 54.2 | 41.4 | 41.4 | 16.1 | 28.1 | 28.1 | 14.0 | 26.0 | 26.0 |
| Actuated g/C Ratio | 0.43 | 0.34 | 0.34 | 0.45 | 0.34 | 0.34 | 0.13 | 0.23 | 0.23 | 0.12 | 0.22 | 0.22 |
| v/c Ratio | 1.21 | 0.77 | 0.35 | 0.91 | 1.02 | 0.42 | 0.95 | 1.12 | 0.46 | 1.21 | 0.92 | 0.55 |
| Control Delay | 159.1 | 39.3 | 7.8 | 68.0 | 64.8 | 9.5 | 82.2 | 110.7 | 12.9 | 177.0 | 64.7 | 22.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 159.1 | 39.3 | 7.8 | 68.0 | 64.8 | 9.5 | 82.2 | 110.7 | 12.9 | 177.0 | 64.7 | 22.3 |
| LOS | F | D | A | E | E | A | F | F | B | F | E | C |
| Approach Delay | | 54.0 | | | 58.1 | | | 88.3 | | | 79.2 | |
| Approach LOS | | D | | | E | | | F | | | E | |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.21

Intersection Signal Delay: 67.7

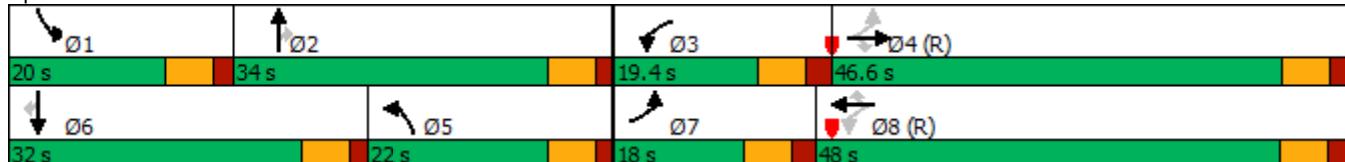
Intersection LOS: E

Intersection Capacity Utilization 103.1%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 62: 59th Ave & Bell Rd



APPENDIX D

City of Glendale Crash Data

Safety Analysis Report

2013,2014,2015,2016,2017

High Crash Intersections by Severity Index (Glendale)

| Rank | Agency | Street1 | Street2 | K Crash Total | A Crash Total | B Crash Total | C Crash Total | O Crash Total | Total Weighted Severity |
|------|----------|-----------------|-------------|---------------|---------------|---------------|---------------|---------------|-------------------------|
| 1 | Glendale | NORTHERN AVE | 51ST AVE | 0 | 8 | 19 | 56 | 153 | 32 |
| 2 | Glendale | NORTHERN AVE | 59TH AVE | 2 | 4 | 26 | 48 | 105 | 26 |
| 3 | Glendale | BELL RD | 75TH AVE | 1 | 5 | 9 | 19 | 61 | 25 |
| 4 | Glendale | GRAND AVE 0 | 57TH DR | 2 | 2 | 1 | 9 | 15 | 18 |
| 5 | Glendale | GLENDALE AVE | 67TH AVE | 0 | 4 | 13 | 36 | 97 | 16 |
| 6 | Glendale | CACTUS RD | 59TH AVE | 0 | 4 | 20 | 35 | 81 | 16 |
| 7 | Glendale | THUNDERBIRD RD | 59TH AVE | 0 | 4 | 16 | 38 | 145 | 16 |
| 8 | Glendale | CAMELBACK RD | 67TH AVE | 0 | 4 | 19 | 32 | 73 | 16 |
| 9 | Glendale | BELL RD | 59TH AVE | 0 | 4 | 15 | 43 | 123 | 16 |
| 10 | Glendale | PEORIA AVE | 51ST AVE | 2 | 1 | 15 | 27 | 85 | 14 |
| 11 | Glendale | BETHANY HOME RD | 43RD AVE | 1 | 2 | 10 | 21 | 53 | 13 |
| 12 | Glendale | CAMELBACK RD | 59TH AVE | 1 | 2 | 9 | 47 | 100 | 13 |
| 13 | Glendale | BELL RD | 63RD AVE | 1 | 2 | 5 | 16 | 54 | 13 |
| 14 | Glendale | THUNDERBIRD RD | 57TH DR | 1 | 2 | 4 | 26 | 47 | 13 |
| 15 | Glendale | OLIVE AVE | 47TH AVE | 1 | 2 | 1 | 15 | 28 | 13 |
| 16 | Glendale | PEORIA AVE | 63RD AVE | 1 | 2 | 2 | 13 | 17 | 13 |
| 17 | Glendale | BETHANY HOME RD | 59TH AVE | 0 | 3 | 23 | 33 | 115 | 12 |
| 18 | Glendale | BETHANY HOME RD | 65TH AVE | 0 | 3 | 5 | 11 | 21 | 12 |
| 19 | Glendale | BEARDSLEY RD | 75TH AVE | 0 | 3 | 1 | 5 | 37 | 12 |
| 20 | Glendale | OLIVE AVE | 59TH AVE | 0 | 3 | 13 | 37 | 100 | 12 |
| 21 | Glendale | THUNDERBIRD RD | 55TH AVE | 0 | 3 | 11 | 19 | 39 | 12 |
| 22 | Glendale | BELL RD | 79TH AVE | 0 | 3 | 6 | 31 | 75 | 12 |
| 23 | Glendale | OLIVE AVE | 67TH AVE | 0 | 3 | 9 | 13 | 72 | 12 |
| 24 | Glendale | CACTUS RD | 57TH AVE | 0 | 3 | 0 | 0 | 9 | 12 |
| 25 | Glendale | ORANGEWOOD AVE | 43RD AVE | 0 | 3 | 4 | 4 | 3 | 12 |
| 26 | Glendale | CAMELBACK RD | 51ST AVE | 0 | 3 | 21 | 44 | 115 | 12 |
| 27 | Glendale | GLENDALE AVE | 83RD AVE | 2 | 0 | 9 | 15 | 64 | 10 |
| 28 | Glendale | NORTHERN AVE | GRAND AVE 0 | 2 | 0 | 4 | 10 | 33 | 10 |
| 29 | Glendale | GLENDALE AVE | 75TH AVE | 2 | 0 | 10 | 31 | 77 | 10 |
| 30 | Glendale | NORTHERN AVE | 55TH AVE | 1 | 1 | 3 | 15 | 31 | 9 |
| 31 | Glendale | BETHANY HOME RD | 60TH AVE | 1 | 1 | 6 | 0 | 9 | 9 |
| 32 | Glendale | UNION HILLS DR | 67TH AVE | 1 | 1 | 6 | 13 | 57 | 9 |
| 33 | Glendale | OLIVE AVE | 61ST AVE | 1 | 1 | 4 | 8 | 21 | 9 |
| 34 | Glendale | CALAVAR RD | 59TH AVE | 1 | 1 | 2 | 4 | 13 | 9 |
| 35 | Glendale | OLIVE AVE | 55TH AVE | 1 | 1 | 3 | 10 | 13 | 9 |

| Rank | Agency | Street1 | Street2 | K Crash Total | A Crash Total | B Crash Total | C Crash Total | O Crash Total | Total Weighted Severity |
|------|----------|-------------------|--------------|---------------|---------------|---------------|---------------|---------------|-------------------------|
| 76 | Glendale | MOUNTAIN VIEW RD | 67TH AVE | 1 | 0 | 0 | 5 | 13 | 5 |
| 77 | Glendale | HAYWARD AVE | 59TH AVE | 1 | 0 | 4 | 7 | 21 | 5 |
| 78 | Glendale | COLUMBINE DR | ASTER DR | 1 | 0 | 0 | 0 | 0 | 5 |
| 79 | Glendale | CAMELBACK RD | 87TH AVE | 1 | 0 | 1 | 1 | 3 | 5 |
| 80 | Glendale | CACTUS RD | 63RD AVE | 1 | 0 | 2 | 0 | 5 | 5 |
| 81 | Glendale | CACTUS RD | 61ST AVE | 1 | 0 | 1 | 4 | 6 | 5 |
| 82 | Glendale | GLENDALE AVE | 59TH AVE | 1 | 0 | 15 | 26 | 70 | 5 |
| 83 | Glendale | BETHANY HOME RD | 71ST AVE | 0 | 1 | 3 | 7 | 23 | 4 |
| 84 | Glendale | COUNTRY GABLES DR | 55TH AVE | 0 | 1 | 0 | 0 | 0 | 4 |
| 85 | Glendale | BEARDSLEY RD | 59TH AVE | 0 | 1 | 1 | 8 | 41 | 4 |
| 86 | Glendale | PARADISE LN | 67TH AVE | 0 | 1 | 2 | 3 | 11 | 4 |
| 87 | Glendale | STATE AVE | 55TH AVE | 0 | 1 | 0 | 1 | 1 | 4 |
| 88 | Glendale | BETHANY HOME RD | 67TH AVE | 0 | 1 | 3 | 22 | 100 | 4 |
| 89 | Glendale | GLENDALE AVE | 48TH AVE | 0 | 1 | 1 | 0 | 4 | 4 |
| 90 | Glendale | CAMELBACK RD | 63RD AVE | 0 | 1 | 3 | 17 | 26 | 4 |
| 91 | Glendale | CAMELBACK RD | 65TH AVE | 0 | 1 | 2 | 0 | 1 | 4 |
| 92 | Glendale | NORTHERN AVE | 61ST AVE | 0 | 1 | 3 | 4 | 20 | 4 |
| 93 | Glendale | OLIVE AVE A | 67TH AVE | 0 | 1 | 2 | 7 | 21 | 4 |
| 94 | Glendale | BETHANY HOME RD | 83RD AVE | 0 | 1 | 2 | 7 | 22 | 4 |
| 95 | Glendale | GREENWAY RD | 66TH AVE | 0 | 1 | 1 | 3 | 4 | 4 |
| 96 | Glendale | MARYLAND AVE | 67TH AVE | 0 | 1 | 4 | 9 | 13 | 4 |
| 97 | Glendale | BELL RD | 67TH AVE | 0 | 1 | 12 | 26 | 104 | 4 |
| 98 | Glendale | GLENDALE AVE | EL MIRAGE RD | 0 | 1 | 3 | 12 | 24 | 4 |
| 99 | Glendale | GLENDALE AVE | 95TH AVE | 0 | 1 | 0 | 4 | 20 | 4 |
| 100 | Glendale | GLENDALE AVE | 55TH AVE | 0 | 1 | 0 | 6 | 23 | 4 |
| 101 | Glendale | BROWN ST | 59TH AVE | 0 | 1 | 2 | 2 | 15 | 4 |
| 102 | Glendale | BEARDSLEY RD | S 101 | 0 | 1 | 0 | 1 | 3 | 4 |
| 103 | Glendale | OLIVE AVE | 56TH DR | 0 | 1 | 0 | 1 | 0 | 4 |
| 104 | Glendale | PEORIA AVE | 47TH AVE | 0 | 1 | 2 | 11 | 10 | 4 |
| 105 | Glendale | GRAND AVE | 67TH AVE A | 0 | 1 | 0 | 0 | 2 | 4 |
| 106 | Glendale | BELL RD | 55TH AVE | 0 | 1 | 0 | 6 | 24 | 4 |
| 107 | Glendale | FREEWAY LN | 51ST AVE | 0 | 1 | 0 | 0 | 1 | 4 |
| 108 | Glendale | PEORIA AVE | 63RD DR | 0 | 1 | 0 | 0 | 0 | 4 |
| 109 | Glendale | MARYLAND AVE A | 83RD AVE | 0 | 1 | 0 | 0 | 1 | 4 |
| 110 | Glendale | ORANGEWOOD AVE | 71ST AVE | 0 | 1 | 3 | 2 | 5 | 4 |
| 111 | Glendale | DESERT COVE AVE | 59TH AVE | 0 | 1 | 0 | 1 | 2 | 4 |
| 112 | Glendale | OLIVE AVE | 63RD AVE | 0 | 1 | 2 | 8 | 17 | 4 |
| 113 | Glendale | MOUNTAIN VIEW RD | 45TH AVE | 0 | 1 | 0 | 0 | 1 | 4 |
| 114 | Glendale | GLENDALE AVE | 52ND AVE | 0 | 1 | 0 | 1 | 3 | 4 |
| 115 | Glendale | OLIVE AVE A | 56TH LN | 0 | 1 | 1 | 0 | 1 | 4 |

| Rank | Agency | Street1 | Street2 | K Crash Total | A Crash Total | B Crash Total | C Crash Total | O Crash Total | Total Weighted Severity |
|------|----------|-------------------|------------|---------------|---------------|---------------|---------------|---------------|-------------------------|
| 116 | Glendale | GRAND AVE | 51ST AVE | 0 | 1 | 0 | 3 | 13 | 4 |
| 117 | Glendale | CAROL ANN WAY | 68TH DR | 0 | 1 | 0 | 0 | 0 | 4 |
| 118 | Glendale | PERSHING AVE | 67TH AVE | 0 | 1 | 0 | 0 | 0 | 4 |
| 119 | Glendale | ALICE AVE | 67TH AVE | 0 | 1 | 1 | 4 | 10 | 4 |
| 120 | Glendale | OLIVE AVE | 65TH AVE | 0 | 1 | 2 | 7 | 15 | 4 |
| 121 | Glendale | FLYNN LN | 51ST AVE | 0 | 1 | 0 | 0 | 1 | 4 |
| 122 | Glendale | CAMINO SAN XAVIER | 75TH AVE | 0 | 1 | 2 | 8 | 26 | 4 |
| 123 | Glendale | BETHANY HOME RD | 55TH AVE | 0 | 1 | 2 | 10 | 28 | 4 |
| 124 | Glendale | VOGEL AVE | 59TH AVE | 0 | 1 | 4 | 3 | 14 | 4 |
| 125 | Glendale | CAMELBACK RD | 91ST AVE | 0 | 1 | 6 | 11 | 43 | 4 |
| 126 | Glendale | FRIER DR | 67TH AVE A | 0 | 1 | 1 | 2 | 3 | 4 |
| 127 | Glendale | GLENN DR | 56TH AVE | 0 | 1 | 0 | 0 | 2 | 4 |
| 128 | Glendale | MYRTLE AVE | GRAND AVE | 0 | 1 | 4 | 4 | 29 | 4 |
| 129 | Glendale | NORTHERN AVE | 70TH AVE | 0 | 1 | 0 | 2 | 5 | 4 |
| 130 | Glendale | ORANGEWOOD AVE | 67TH AVE | 0 | 1 | 2 | 5 | 15 | 4 |
| 131 | Glendale | THUNDERBIRD RD | 52ND AVE | 0 | 1 | 0 | 6 | 7 | 4 |
| 132 | Glendale | GRAND AVE | 57TH DR | 0 | 1 | 1 | 6 | 18 | 4 |
| 133 | Glendale | STATE AVE | 51ST AVE | 0 | 1 | 0 | 1 | 0 | 4 |
| 134 | Glendale | CAMELBACK RD | 83RD AVE | 0 | 1 | 9 | 32 | 90 | 4 |
| 135 | Glendale | OLIVE AVE | 57TH DR | 0 | 1 | 0 | 2 | 0 | 4 |
| 136 | Glendale | LAMAR RD | 51ST AVE | 0 | 1 | 1 | 0 | 11 | 4 |
| 137 | Glendale | BETHANY HOME RD | 61ST AVE | 0 | 1 | 0 | 7 | 15 | 4 |
| 138 | Glendale | OCOTILLO RD B | 67TH AVE | 0 | 1 | 1 | 4 | 5 | 4 |
| 139 | Glendale | BETHANY HOME RD | 57TH AVE | 0 | 1 | 4 | 8 | 9 | 4 |
| 140 | Glendale | UNION HILLS DR | 77TH AVE | 0 | 1 | 0 | 1 | 7 | 4 |
| 141 | Glendale | ACOMA DR | 59TH AVE | 0 | 1 | 1 | 2 | 3 | 4 |
| 142 | Glendale | BELL RD | S 1010 | 0 | 1 | 0 | 2 | 9 | 4 |
| 143 | Glendale | BROWN ST | 67TH AVE | 0 | 1 | 0 | 1 | 1 | 4 |
| 144 | Glendale | PALO VERDE AVE | 67TH AVE | 0 | 1 | 1 | 0 | 0 | 4 |
| 145 | Glendale | GLENDALE AVE | 51ST AVE | 0 | 1 | 15 | 27 | 92 | 4 |
| 146 | Glendale | MARYLAND AVE A | 51ST AVE | 0 | 1 | 4 | 8 | 19 | 4 |
| 147 | Glendale | BELL RD | 77TH AVE | 0 | 1 | 5 | 25 | 54 | 4 |
| 148 | Glendale | CAMELBACK RD | 58TH AVE | 0 | 1 | 2 | 3 | 13 | 4 |
| 149 | Glendale | CAMELBACK RD | 95TH AVE | 0 | 1 | 2 | 8 | 17 | 4 |
| 150 | Glendale | GLENDALE AVE | 47TH AVE | 0 | 1 | 3 | 10 | 27 | 4 |
| 151 | Glendale | CHOLLA ST | 51ST AVE | 0 | 1 | 1 | 5 | 6 | 4 |
| 152 | Glendale | CAMELBACK RD | 55TH AVE | 0 | 1 | 4 | 19 | 51 | 4 |
| 153 | Glendale | ROYAL PALM RD | 51ST AVE | 0 | 1 | 0 | 0 | 5 | 4 |
| 154 | Glendale | THUNDERBIRD RD | 56TH AVE | 0 | 1 | 0 | 2 | 8 | 4 |
| 155 | Glendale | SWEETWATER AVE | 59TH AVE | 0 | 1 | 3 | 11 | 17 | 4 |

| Rank | Agency | Street1 | Street2 | K Crash Total | A Crash Total | B Crash Total | C Crash Total | O Crash Total | Total Weighted Severity |
|------|----------|-------------------|--------------|---------------|---------------|---------------|---------------|---------------|-------------------------|
| 316 | Glendale | MISSOURI AVE | 65TH AVE | 0 | 0 | 0 | 1 | 1 | 0 |
| 317 | Glendale | UNION HILLS DR | 75TH DR | 0 | 0 | 0 | 0 | 1 | 0 |
| 318 | Glendale | OCOTILLO RD | 81ST AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 319 | Glendale | OLIVE AVE A | 52ND DR | 0 | 0 | 1 | 0 | 0 | 0 |
| 320 | Glendale | CHRISTY DR | 47TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 321 | Glendale | WALTANN LN | 53RD AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 322 | Glendale | MARLETTA AVE | 51ST AVE | 0 | 0 | 1 | 2 | 4 | 0 |
| 323 | Glendale | FLEETWOOD LN | 75TH AVE | 0 | 0 | 0 | 1 | 3 | 0 |
| 324 | Glendale | GRAND AVE 0 | 51ST AVE 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 325 | Glendale | LITCHFIELD RD | CLAREMONT ST | 0 | 0 | 0 | 1 | 3 | 0 |
| 326 | Glendale | JOAN DE ARC AVE | 51ST DR | 0 | 0 | 0 | 0 | 1 | 0 |
| 327 | Glendale | CITRUS WAY | 43RD AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 328 | Glendale | ALICE AVE | 65TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 329 | Glendale | MONTEBELLO AVE | 72ND AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 330 | Glendale | GLENDALE AVE | 135TH AVE | 0 | 0 | 0 | 2 | 2 | 0 |
| 331 | Glendale | STELLA AVE | 78TH LN | 0 | 0 | 0 | 0 | 1 | 0 |
| 332 | Glendale | SUNNYSLOPE LN | 47TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 333 | Glendale | ALICE AVE | 63RD AVE | 0 | 0 | 0 | 1 | 0 | 0 |
| 334 | Glendale | DYSART RD | CAMELBACK RD | 0 | 0 | 9 | 11 | 33 | 0 |
| 335 | Glendale | HILLCREST BLVD | 67TH AVE | 0 | 0 | 0 | 8 | 29 | 0 |
| 336 | Glendale | ROYAL PALM RD | 47TH AVE | 0 | 0 | 0 | 0 | 3 | 0 |
| 337 | Glendale | BETHANY HOME RD 2 | 62ND AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 338 | Glendale | MISSOURI AVE | 51ST AVE | 0 | 0 | 1 | 10 | 32 | 0 |
| 339 | Glendale | BETHANY HOME RD | 95TH AVE | 0 | 0 | 0 | 2 | 10 | 0 |
| 340 | Glendale | OCOTILLO RD | 59TH AVE | 0 | 0 | 0 | 1 | 4 | 0 |
| 341 | Glendale | CHERYL DR | 63RD AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 342 | Glendale | POINSETTIA DR | 63RD AVE | 0 | 0 | 0 | 1 | 0 | 0 |
| 343 | Glendale | BROWN ST | 47TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 344 | Glendale | BELMONT AVE C | 55TH AVE | 0 | 0 | 1 | 0 | 0 | 0 |
| 345 | Glendale | OCOTILLO RD B | 65TH AVE | 0 | 0 | 0 | 1 | 0 | 0 |
| 346 | Glendale | HAYWARD AVE | 56TH AVE | 0 | 0 | 0 | 0 | 2 | 0 |
| 347 | Glendale | CACTUS RD | 54TH AVE | 0 | 0 | 0 | 0 | 2 | 0 |
| 348 | Glendale | PALO VERDE AVE | 53RD AVE | 0 | 0 | 0 | 1 | 0 | 0 |
| 349 | Glendale | MORTEN AVE | 59TH AVE | 0 | 0 | 0 | 0 | 2 | 0 |
| 350 | Glendale | MISSOURI AVE | 70TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 351 | Glendale | ROSE LN B | 65TH AVE | 0 | 0 | 0 | 1 | 0 | 0 |
| 352 | Glendale | MORTEN AVE | 55TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 353 | Glendale | GLENDALE AVE | S 1010 | 0 | 0 | 1 | 5 | 28 | 0 |
| 354 | Glendale | BELL RD | 73RD AVE | 0 | 0 | 1 | 6 | 28 | 0 |
| 355 | Glendale | MARYLAND AVE A | 76TH DR | 0 | 0 | 0 | 0 | 1 | 0 |

| Rank | Agency | Street1 | Street2 | K Crash Total | A Crash Total | B Crash Total | C Crash Total | O Crash Total | Total Weighted Severity |
|------|----------|------------------|----------|---------------|---------------|---------------|---------------|---------------|-------------------------|
| 556 | Glendale | COLTER ST | 57TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 557 | Glendale | MOUNTAIN VIEW RD | 53RD AVE | 0 | 0 | 0 | 1 | 1 | 0 |
| 558 | Glendale | BELL RD | 69TH AVE | 0 | 0 | 3 | 9 | 18 | 0 |
| 559 | Glendale | MISSOURI AVE | 63RD AVE | 0 | 0 | 0 | 1 | 4 | 0 |
| 560 | Glendale | SIERRA VISTA DR | 47TH AVE | 0 | 0 | 1 | 0 | 0 | 0 |
| 561 | Glendale | COLTER ST | 79TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 562 | Glendale | ROSE GARDEN LN | 67TH AVE | 0 | 0 | 0 | 1 | 1 | 0 |
| 563 | Glendale | MOUNTAIN VIEW RD | 57TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 564 | Glendale | JUNIPER AVE | 69TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 565 | Glendale | MARYLAND AVE A | 63RD AVE | 0 | 0 | 0 | 0 | 2 | 0 |
| 566 | Glendale | COYOTES BLVD | 95TH AVE | 0 | 0 | 1 | 2 | 3 | 0 |
| 567 | Glendale | NORTHERN AVE | 58TH AVE | 0 | 0 | 0 | 0 | 3 | 0 |
| 568 | Glendale | RANCHO DR | 47TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 569 | Glendale | CITRUS WAY | 59TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 570 | Glendale | UNION HILLS DR | 70TH AVE | 0 | 0 | 0 | 1 | 2 | 0 |
| 571 | Glendale | CACTUS RD | 64TH AVE | 0 | 0 | 0 | 1 | 1 | 0 |
| 572 | Glendale | CITRUS WAY | 69TH AVE | 0 | 0 | 0 | 1 | 0 | 0 |
| 573 | Glendale | ROSE LN | 45TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 574 | Glendale | BEARDSLEY RD 0 | 54TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 575 | Glendale | MONTEBELLO AVE | 52ND AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 576 | Glendale | HARMONT DR | 53RD AVE | 0 | 0 | 0 | 0 | 2 | 0 |
| 577 | Glendale | SAINT JOHN AVE | 63RD LN | 0 | 0 | 0 | 0 | 1 | 0 |
| 578 | Glendale | CHOLLA ST | 60TH AVE | 0 | 0 | 0 | 1 | 2 | 0 |
| 579 | Glendale | CROCUS DR | 55TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 580 | Glendale | VOGEL AVE | 63RD DR | 0 | 0 | 0 | 0 | 1 | 0 |
| 581 | Glendale | HAYWARD AVE | 45TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 582 | Glendale | CARO RD | 75TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 583 | Glendale | OCOTILLO RD B | 83RD AVE | 0 | 0 | 0 | 0 | 3 | 0 |
| 584 | Glendale | MCLELLAN RD | 63RD AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 585 | Glendale | OLIVE AVE A | 63RD AVE | 0 | 0 | 2 | 2 | 10 | 0 |
| 586 | Glendale | CAMELBACK RD | 71ST AVE | 0 | 0 | 3 | 2 | 9 | 0 |
| 587 | Glendale | PASADENA AVE | 75TH LN | 0 | 0 | 0 | 0 | 1 | 0 |
| 588 | Glendale | FRIER DR | 49TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 589 | Glendale | MISSOURI AVE | 75TH AVE | 0 | 0 | 1 | 1 | 4 | 0 |
| 590 | Glendale | CAVALIER DR | 83RD AVE | 0 | 0 | 0 | 0 | 2 | 0 |
| 591 | Glendale | MAUI LN | 53RD AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 592 | Glendale | TOPEKA DR | 79TH AVE | 0 | 0 | 1 | 0 | 0 | 0 |
| 593 | Glendale | BUTLER DR | 45TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 594 | Glendale | PECK DR | 69TH DR | 0 | 0 | 0 | 0 | 1 | 0 |
| 595 | Glendale | GLENDALE AVE | 50TH AVE | 0 | 0 | 0 | 1 | 2 | 0 |

| Rank | Agency | Street1 | Street2 | K Crash Total | A Crash Total | B Crash Total | C Crash Total | O Crash Total | Total Weighted Severity |
|------|----------|------------------|-----------------|---------------|---------------|---------------|---------------|---------------|-------------------------|
| 1196 | Glendale | KEIM DR | 69TH DR | 0 | 0 | 0 | 0 | 1 | 0 |
| 1197 | Glendale | MISSOURI AVE | 59TH AVE | 0 | 0 | 4 | 13 | 23 | 0 |
| 1198 | Glendale | GLENDALE AVE | 57TH DR | 0 | 0 | 2 | 7 | 22 | 0 |
| 1199 | Glendale | SIERRA ST | 53RD AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1200 | Glendale | GROVERS AVE | 67TH AVE | 0 | 0 | 1 | 2 | 2 | 0 |
| 1201 | Glendale | ROYAL PALM RD | 63RD AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1202 | Glendale | SOLANO DR | 47TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1203 | Glendale | CAMELBACK RD | 47TH AVE | 0 | 0 | 3 | 3 | 13 | 0 |
| 1204 | Glendale | COLTER ST | 71ST AVE | 0 | 0 | 0 | 1 | 1 | 0 |
| 1205 | Glendale | KINGS AVE | 63RD AVE | 0 | 0 | 1 | 0 | 4 | 0 |
| 1206 | Glendale | EL MIRAGE RD | BETHANY HOME RD | 0 | 0 | 0 | 0 | 1 | 0 |
| 1207 | Glendale | BELL RD | 83RD AVE | 0 | 0 | 3 | 36 | 161 | 0 |
| 1208 | Glendale | NORTHERN AVE | 44TH DR | 0 | 0 | 0 | 3 | 9 | 0 |
| 1209 | Glendale | PUGET AVE | 68TH LN | 0 | 0 | 0 | 0 | 1 | 0 |
| 1210 | Glendale | BERYL AVE | 51ST AVE | 0 | 0 | 0 | 1 | 0 | 0 |
| 1211 | Glendale | WALTANN LN | 55TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1212 | Glendale | MISSOURI AVE | 87TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1213 | Glendale | OCOTILLO RD | 87TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1214 | Glendale | KEIM DR | 69TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1215 | Glendale | GLENN DR | 48TH AVE | 0 | 0 | 0 | 1 | 1 | 0 |
| 1216 | Glendale | OLIVE AVE A | 49TH DR | 0 | 0 | 0 | 0 | 1 | 0 |
| 1217 | Glendale | DESERT COVE AVE | 66TH DR | 0 | 0 | 0 | 1 | 0 | 0 |
| 1218 | Glendale | BARBARA AVE | 51ST AVE | 0 | 0 | 2 | 1 | 6 | 0 |
| 1219 | Glendale | SELDON LN | 59TH AVE | 0 | 0 | 0 | 0 | 4 | 0 |
| 1220 | Glendale | BELMONT AVE | 51ST AVE | 0 | 0 | 0 | 0 | 2 | 0 |
| 1221 | Glendale | BEARDSLEY RD | 57TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1222 | Glendale | 51ST AVE 1 | 51ST AVE | 0 | 0 | 1 | 0 | 2 | 0 |
| 1223 | Glendale | LAMAR RD | 57TH DR | 0 | 0 | 0 | 0 | 2 | 0 |
| 1224 | Glendale | VILLAGE DR | 52ND DR | 0 | 0 | 0 | 0 | 1 | 0 |
| 1225 | Glendale | MOUNTAIN VIEW RD | 56TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1226 | Glendale | VOLTAIRE DR | 55TH AVE | 0 | 0 | 0 | 1 | 4 | 0 |
| 1227 | Glendale | DESERT HILLS DR | 53RD AVE | 0 | 0 | 1 | 0 | 0 | 0 |
| 1228 | Glendale | MYRTLE AVE | 75TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1229 | Glendale | ORCHID LN | 50TH DR | 0 | 0 | 0 | 0 | 1 | 0 |
| 1230 | Glendale | OCOTILLO RD | 47TH AVE | 0 | 0 | 0 | 0 | 3 | 0 |
| 1231 | Glendale | ROSE LN | 70TH LN | 0 | 0 | 0 | 0 | 1 | 0 |
| 1232 | Glendale | DENTON LN | 75TH DR | 0 | 0 | 0 | 0 | 1 | 0 |
| 1233 | Glendale | PALMAIRE AVE | 68TH AVE | 0 | 0 | 0 | 0 | 1 | 0 |
| 1234 | Glendale | NICOLET AVE | 76TH DR | 0 | 0 | 1 | 0 | 0 | 0 |
| 1235 | Glendale | CACTUS WREN DR | 73RD DR | 0 | 0 | 0 | 0 | 1 | 0 |

APPENDIX E

Bell Road Crash Rates

| Source | Bell Rd Intersection | Crashes in 5-year Period | | | | | | Entering ADT - Major | Entering ADT - Minor | Crash Rate |
|----------|----------------------|--------------------------|---|----|----|-----|-------|----------------------|----------------------|------------|
| | | K | A | B | C | O | Total | | | |
| MAG | 91st | 0 | 4 | 15 | 12 | 39 | 70 | 61047 | 12313 | 0.52 |
| MAG | 87th | 0 | 3 | 10 | 8 | 47 | 68 | 61047 | 5271 | 0.56 |
| MAG | 83rd | 0 | 0 | 3 | 28 | 118 | 149 | 61617 | 25262 | 0.94 |
| Glendale | 79th | 0 | 3 | 6 | 31 | 75 | 115 | 56614 | 10536 | 0.94 |
| Glendale | 77th | 0 | 1 | 5 | 25 | 54 | 85 | 56614 | 8178 | 0.72 |
| Glendale | 75th | 1 | 5 | 9 | 19 | 61 | 95 | 56614 | 23243 | 0.65 |
| Glendale | 67th | 0 | 1 | 12 | 26 | 104 | 143 | 48446 | 24274 | 1.08 |
| Glendale | 59th | 0 | 4 | 15 | 43 | 123 | 185 | 50840 | 26712 | 1.31 |